INNOVATOR IN ELECTRONICS

MURATA PRODUCTS
Lineup 2018

K70E.pdf
Jan.16,2018

2018 MURATA PRODUCTS Lineup

Capacitors

Noise Suppression Products/EMI Suppression Filters

Inductors (Coils)

Resistors

Timing Devices

Filters

RF Components

Sensors

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Thermistors

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Power Devices

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Energy Devices/Batteries

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Sound Components (Buzzer)

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Others

Application Guides

Capacitors

The most comprehensive product lineup in the industry, providing ideal solutions, responding to all possible requirements.

Summary

Using Murata's unique material technology, we offer a variety of capacitors covering a wide range of voltages. Murata also offers technical support that includes design kits and a comprehensive set of software tools to simulate virtually any circuit condition, satisfying the demands of many applications.

Lineup

- Ceramic Capacitors (SMD, lead type, mold type)
- Polymer Aluminum Electrolytic Capacitors
- Supercapacitors (EDLC)

https://www.murata.com/en-global/products/capacitor

WEB Product Search Engine

1 Search by Part Number

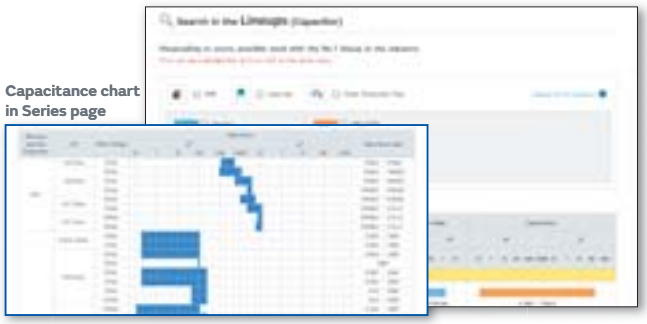
You can search for capacitors by specifying the alphanumeric characters in the part number.
The packing codes shown contain the substitute character "#". If you enter the official packing code, part numbers that contain that packing code will be matched.

2 Search by Specifications

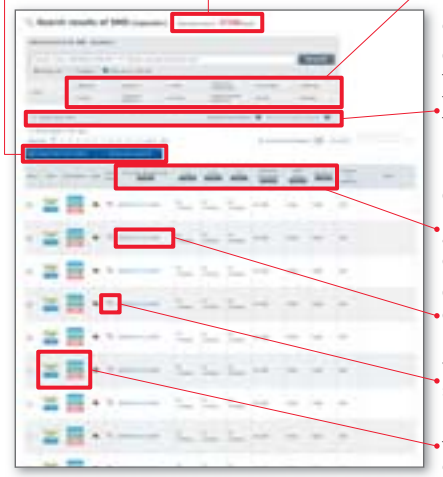
You can search for SMD, lead type, or screw termination type capacitors by indicating specifications such as application, capacitance, rated voltage, or temperature characteristics.
You can narrow your search by entering values of ranges, and by specifying product characteristics.
The items for narrowing searches are linked, so specifying one condition causes selectable options for the other items to allow input only of conditions that match the relevant part numbers.

3 Search in the Lineups

You can search for capacitors by specifying the series lineup.
You can also confirm items such as characteristics and applications on each series page.



Search results



Icons

General	For applications that do not require a particular reliability, such as general equipment.
Info-tainment	Infotainment for Automotive Products for entertainment equipment like car navigation, car audio, and body control equipment like wipers and power windows.
Power-train	Powertrain/Safety for Automotive Products used for applications (running, turning, stopping, and safety devices) that particularly concern human life, such as in devices for automotive.
Medical Device	Medical-grade products for Implanted Medical Devices These products are intended for use in implanted medical devices such as cardiac pacemakers, cochlear implants, insulin pumps, and gastric electrostimulators. They are suitable for use in non-critical circuits.*1 *1 Non-critical circuits This term refers to circuits in implanted medical devices that are not directly linked to life support, i.e., circuits that will not directly endanger the life of the patient should the functionality of the device be reduced or halted by failure of the circuit.
AEC-Q200	AEC-Q200 compliant product
Safety standard	Products that acquired safety standard certification IEC60384-14.
Japanese Safety Law	Products that are based on the Electrical Appliance and Material Safety Law of Japan.
High Q	Low dissipation for high frequency By devising ceramic materials and electrode materials, low dissipation is achieved in frequency bands of VHF, UHF, and microwave or beyond.
Low ESL	Low inductance This capacitor is designed so that the parasitic inductance component (ESL) that the capacitor has on the high frequency side becomes lower.
Fail safe	Fail safe product This capacitor is designed to prevent failures as much as possible by short mode.
Deflecting crack	Product resistant to deflection cracking This capacitor is designed to prevent failures as much as possible by short mode caused by cracking when there is board deflection.
Soldering crack	Product with solder cracking suppression This capacitor is configured with metal terminals and leads connected to the chip. The metal terminals and leads relieve the stress from expansion and contraction of the solder, to suppress solder cracking.
Anti-noise	Product suitable for acoustic noise reduction and low distortion This product suppresses acoustic noise, which occurs when a ceramic capacitor is used, by devising the materials and configuration.
Effective Cap	No DC bias characteristics Polymer capacitor is no capacitance change with DC bias due to aluminum oxidized film for dielectric.
EMI FIL®	Low-inductance product suitable for noise suppression. This product has extremely low ESL and is suitable for suppression of noise, including high frequencies. This product can also be used as a low-ESL, high-performance bypass capacitor.
Bonding	Product for bonding Since gold is used for the external electrodes, the capacitor can be mounted by die bonding/wire bonding.
Limited to conductive glue mounting	Limited to Conductive Glue Mounting Since silver palladium is used for the external electrodes, the capacitor can be mounted by conductive adhesive.

Capacitors

Product Lineup

For general

General — SMD

Solder mounting

Chip type

GRM			p5
GRM		For LCD backlight inverter circuit only	p7
GR3	Anti-noise	High effective capacitance & high ripple current	p7
GRJ	Deflecting crack	Soft termination	p8
GXM	Water Repellent		WEB
GR4		For information devices only	p9
GR7		For camera flash circuit only	p9
GJM	High Q		p9
GQM	High Q	High power	p9
GA2	Japanese Safety Law	Based on the Electrical Appliance and Material Safety Law of Japan	p10
GA3	Safety standard		p10
LLL	Low ESL	LW reversed	p11
LLA	Low ESL	8 terminals	p11
LLM	Low ESL	10 terminals	p11
LLR	Low ESL	LW reversed controlled ESR	p12
NFM	Low ESL	3 terminals	p12
GJ4	Anti-noise	Low distortion	WEB
GJ8	Anti-noise	Low acoustic noise	WEB

On interposer board

ZRA	Anti-noise		WEB
ZRB	Anti-noise		WEB

Metal terminal type

KRM	Anti-noise, Deflecting crack, Soldering crack		p12
KR3	Anti-noise, Deflecting crack, Soldering crack	High effective capacitance & high ripple current	p13

Resin molding SMD type

DK1	Safety standard		p28

Polymer Aluminum Electrolytic Capacitors

ECAS	Anti-noise, Deflecting crack, Effective Cap		p29
ECNS	Anti-noise, Deflecting crack, Effective Cap		p29

Wire bonding mounting

Chip type

GMA		Microchip	p13
GMD			p13

Lead type

Solder mounting

RDE	Anti-noise, Deflecting crack, Soldering crack		p21
DEH		High temperature low loss	WEB
DEA		High temperature Class 1	WEB
DEB		Class 2	WEB
DEC			WEB
DEF		For LCD backlight inverter circuit only	WEB
DHR	Ultrahigh-voltage, Deflecting crack, Soldering crack		p23
DEJ	Japanese Safety Law	Based on the Electrical Appliance and Material Safety Law of Japan	p23
DE1	Safety standard	X1/Y1 Class certified product	p24
DE2	Safety standard	X1/Y2 Class certified product	p24

For general

General — Screw termination mounting

DHS	Ultrahigh-voltage		p28
DHK	Ultrahigh-voltage	High voltage AC rated	p28

Infotainment for automotive

Infotainment, AEC-Q200 — SMD

Solder mounting

Chip type

GRT			p14

Powertrain/Safety for automotive

Powertrain, AEC-Q200 — SMD

Solder mounting

Chip type

GCM			p15
GC3	Anti-noise	High effective capacitance & high ripple current	p16
GCJ	Fail safe, Deflecting crack	Soft termination	p16
GGM	Water Repellent		WEB
GCQ	High Q		p17
GCD	Fail safe, Deflecting crack	MLSC design	p18
GCE	Fail safe, Deflecting crack	Soft termination MLSC design	p18
GGD	Fail safe, Deflecting crack, Water Repellent	MLSC design	WEB
NFM	Low ESL	3 terminals	p18

Metal terminal type

KCM	Anti-noise, Deflecting crack, Soldering crack		p18
KC3	Anti-noise, Deflecting crack, Soldering crack	High effective capacitance & high ripple current	p19
KCA	Safety standard, Anti-noise, Deflecting crack, Soldering crack		p19

Limited to Conductive Glue Mounting

Chip type

GCB	Deflecting crack, Soldering crack	Ni plating + Pd plating termination conductive glue mounting	p19
GCG	Deflecting crack, Soldering crack	AgPd termination conductive glue mounting	p19

Lead type

Solder mounting

RCE	Anti-noise, Deflecting crack, Soldering crack		p25
RHE	Anti-noise, Deflecting crack, Soldering crack	150°C operation leaded	p27
RHS	Anti-noise, Deflecting crack, Soldering crack	200°C operation leaded	p27
DE6	Safety standard		p27

Medical-grade products for implanted medical devices

Medical Device — SMD

Solder mounting

Chip type

GCH			p20

Ceramic capacitors SMD type For General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose

Temperature Compensating Type

GRM

General

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GRM02	0.4X0.2 <01005>	50	0.20pF – 100pF
		25	120pF – 220pF
		16	120pF – 220pF
GRM03	0.6X0.3 <0201>	100	0.10pF – 100pF
		50	0.10pF – 220pF
		25	270pF – 1000pF
GRM15	1.0X0.5 <0402>	100	0.10pF – 100pF
		50	0.10pF – 1000pF
		10	1200pF – 4700pF
GRM18	1.6X0.8 <0603>	100	0.50pF – 1500pF
		50	0.50pF – 10000pF
		10	5600pF – 22000pF
GRM21	2.0X1.25 <0805>	630	10pF – 1200pF
		250	10pF – 5600pF
		200	10pF – 5600pF
		100	100pF – 3300pF
		50	1200pF – 47000pF
		10	56000pF – 0.10μF
GRM31	3.2X1.6 <1206>	2k	10pF – 68pF
		1k	10pF – 1000pF
		630	10pF – 4700pF
		500	10pF – 4700pF
		250	390pF – 22000pF
		200	2700pF – 10000pF
		100	1800pF – 0.10μF
		50	12000pF – 0.10μF
		25	0.12μF
		16	0.12μF
GRM32	3.2X2.5 <1210>	2k	82pF – 220pF
		1k	1200pF – 2200pF
		630	1200pF – 10000pF
		500	1200pF – 10000pF
		250	27000pF – 47000pF
GRM42	4.5X2.0 <1808>	3.15k	10pF – 100pF
GRM43	4.5X3.2 <1812>	1k	2700pF – 4700pF
		630	12000pF – 22000pF
		500	12000pF – 22000pF
GRM55	5.7X5.0 <2220>	1k	5600pF – 10000pF
		630	27000pF – 47000pF
		500	27000pF – 47000pF

Continued on the following page. ↗

Capacitors

High Dielectric Constant Type

GRM

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRM02	0.4X0.2 <01005>	16	100pF – 1000pF
		10	100pF – 10000pF
		6.3	1000pF – 0.10μF
		4	15000pF – 0.10μF
		2.5	0.10μF
GRM03	0.6X0.3 <0201>	50	100pF – 1500pF
		35	0.10μF
		25	100pF – 0.10μF
		16	2200pF – 0.10μF
		10	4700pF – 0.22μF
		6.3	4700pF – 0.22μF
		4	0.22μF
GRM15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.47μF
		35	0.22μF – 1.0μF
		25	2200pF – 2.2μF
		16	3300pF – 2.2μF
		10	15000pF – 4.7μF
		6.3	0.10μF – 4.7μF
		4	0.10μF – 10μF
		2.5	0.10μF – 10μF
GRM18	1.6X0.8 <0603>	250	220pF – 2200pF
		200	220pF – 2200pF
		50	2.2μF
		35	2.2μF – 4.7μF
		25	1.0μF – 10μF
		16	1.0μF – 10μF
		10	2.2μF – 10μF
		6.3	4.7μF – 22μF
		4	10μF – 22μF
GRM21	2.0X1.25 <0805>	500	1000pF – 10000pF
		250	1000pF – 22000pF
		200	1000pF – 22000pF
		50	1.0μF – 4.7μF
		35	2.2μF – 10μF
		25	1.0μF – 22μF
		16	1.0μF – 22μF
		10	2.2μF – 47μF
		6.3	10μF – 100μF
		4	10μF – 100μF
		2.5	47μF – 100μF
GRM31	3.2X1.6 <1206>	1k	470pF – 10000pF
		630	1000pF – 22000pF
		500	15000pF – 47000pF
		250	15000pF – 0.10μF
		200	15000pF – 0.10μF
		100	1.0μF
		50	1.0μF – 10μF
		35	10μF
		25	10μF – 22μF
		16	10μF – 47μF
		10	22μF – 100μF

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Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRM31	3.2X1.6 <1206>	6.3	22µF – 150µF
		4	47µF – 220µF
		2.5	150µF – 220µF
GRM32	3.2X2.5 <1210>	1k	6800pF – 22000pF
		630	22000pF – 47000pF
		500	68000pF – 0.10µF
		250	68000pF – 0.22µF
		200	68000pF – 0.22µF
		100	1.0µF – 4.7µF
		80	4.7µF
		63	10µF
		50	4.7µF – 10µF
		35	10µF
		25	10µF – 22µF
		16	22µF – 47µF
		10	47µF – 100µF
		6.3	47µF – 100µF
		4	100µF
GRM43	4.5X3.2 <1812>	1k	33000pF – 47000pF
		630	68000pF – 0.10µF
		500	0.15µF – 0.22µF
		250	0.15µF – 0.47µF
		200	0.15µF – 0.47µF
GRM55	5.7X5.0 <2220>	1k	68000pF – 0.10µF
		630	0.15µF – 0.22µF
		500	0.33µF – 0.47µF
		250	0.33µF – 1.0µF
		200	0.33µF – 1.0µF

Chip Multilayer Ceramic Capacitors for LCD Backlight Inverter Circuit Only

GRM

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRM42	4.5X2.0 <1808>	3.15k	5.0pF – 47pF

High Effective Capacitance & High Ripple Current Chip Multilayer Ceramic Capacitors for General Purpose

GR3

General Anti-noise

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GR321	2.0X1.25 <0805>	250	10000pF – 22000pF
GR331	3.2X1.6 <1206>	630	10000pF – 15000pF
		450	10000pF – 47000pF
		250	33000pF – 68000pF
GR332	3.2X2.5 <1210>	630	22000pF – 47000pF
		450	68000pF – 0.10µF
		250	0.10µF – 0.15µF

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Capacitors

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GR343	4.5X3.2 <1812>	630	68000pF
		450	0.15μF
		250	0.22μF – 0.33μF
GR355	5.7X5.0 <2220>	630	0.10μF – 0.22μF
		450	0.22μF – 0.47μF
		250	0.47μF – 1.0μF

Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose

GRJ

General | Deflecting crack

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRJ18	1.6X0.8 <0603>	100	1000pF – 0.10μF
		50	1000pF – 0.22μF
		35	1.0μF
		25	47000pF – 1.0μF
		16	0.47μF
		6.3	2.2μF – 4.7μF
GRJ21	2.0X1.25 <0805>	250	1000pF – 22000pF
		100	220pF – 1.0μF
		50	470pF – 1.0μF
		25	1.0μF – 2.2μF
		16	4.7μF
		10	10μF
GRJ31	3.2X1.6 <1206>	1k	470pF – 10000pF
		630	1000pF – 22000pF
		250	15000pF – 0.10μF
		100	0.10μF – 1.0μF
		50	0.10μF – 4.7μF
		35	10μF
		25	2.2μF – 10μF
		16	2.2μF – 10μF
		10	10μF – 22μF
		6.3	22μF
GRJ32	3.2X2.5 <1210>	1k	6800pF – 22000pF
		630	22000pF – 47000pF
		250	68000pF – 0.22μF
		100	2.2μF – 4.7μF
		50	4.7μF – 10μF
		25	10μF – 22μF
		16	22μF
		10	22μF – 47μF
		6.3	47μF
GRJ43	4.5X3.2 <1812>	1k	33000pF – 47000pF
		630	68000pF – 0.10μF
		250	0.15μF – 0.47μF
GRJ55	5.7X5.0 <2220>	1k	68000pF – 0.10μF
		630	0.15μF – 0.22μF
		250	0.33μF – 1.0μF

Chip Multilayer Ceramic Capacitors for Ethernet LAN and Primary-secondary Coupling of DC-DC Converters

GR4

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GR442	4.5X2.0 <1808>	2k	100pF – 1500pF
GR443	4.5X3.2 <1812>	2k	1800pF – 4700pF
GR455	5.7X5.0 <2220>	2k	10000pF

Chip Multilayer Ceramic Capacitors for Camera Flash Circuit Only

GR7

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GR721	2.0X1.25 <0805>	350	10000pF – 27000pF
GR731	3.2X1.6 <1206>	350	10000pF – 47000pF

High Q Chip Multilayer Ceramic Capacitors for General Purpose

GJM

General High Q

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GJM02	0.4X0.2 <01005>	25	0.20pF – 22pF
GJM03	0.6X0.3 <0201>	50	0.20pF – 3.9pF
		25	1.0pF – 33pF
GJM15	1.0X0.5 <0402>	50	0.10pF – 47pF

High Q and High Power Chip Multilayer Ceramic Capacitors for General Purpose

GQM

General High Q

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GQM15	1.0X0.5 <0402>	200	0.10pF – 33pF
		100	36pF – 47pF
GQM18	1.6X0.8 <0603>	250	1.0pF – 47pF
GQM21	2.0X1.25 <0805>	500	1.0pF – 22pF
		250	1.0pF – 100pF
GQM22	2.8X2.8 <1111>	500	1.0pF – 100pF

Capacitors

Based on the Electrical Appliance and Material Safety Law of Japan Chip Multilayer Ceramic Capacitors for General Purpose

GA2

General | Japanese Safety Law

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GA242	4.5X2.0 <1808>	AC250 (r.m.s.)	470pF – 1000pF
GA243	4.5X3.2 <1812>	AC250 (r.m.s.)	2200pF – 47000pF
GA255	5.7X5.0 <2220>	AC250 (r.m.s.)	0.10μF

Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose / IEC60384-14 Class X2

GA3 Type GB

General | Safety standard

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GA355	5.7X5.0 <2220>	AC250 (r.m.s.)	10000pF – 56000pF

Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose / Acquired Certifications of UL60950-1

GA3 Type GD

General | Safety standard

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GA342	4.5X2.0 <1808>	AC250 (r.m.s.)	10pF – 1500pF
GA343	4.5X3.2 <1812>	AC250 (r.m.s.)	1800pF – 4700pF

Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose / Acquired Certifications of IEC60384-14 Class X1/Y2 and UL60950-1

GA3 Type GF

General | Safety standard

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GA342	4.5X2.0 <1808>	AC250 (r.m.s.)	10pF – 1000pF
GA352	5.7X2.8 <2211>	AC250 (r.m.s.)	100pF – 1500pF
GA355	5.7X5.0 <2220>	AC250 (r.m.s.)	1800pF – 4700pF

LW Reversed Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

LLL

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
LLL15	0.5X1.0 <0204>	6.3	0.10μF 0.22μF
		4	0.47μF 1.0μF
LLL1U	0.6X1.0 <02404>	4	4.3μF
LLL18	0.8X1.6 <0306>	50	2200pF 4700pF
		25	10000pF 22000pF
		16	22000pF 47000pF
		10	0.10μF 0.22μF
		4	0.22μF 2.2μF
LLL21	1.25X2.0 <0508>	50	10000pF 22000pF
		25	22000pF 0.10μF
		16	47000pF 0.22μF
		10	0.22μF 1.0μF
		6.3	0.47μF
		4	1.0μF 2.2μF
LLL31	1.6X3.2 <0612>	50	10000pF 0.10μF
		25	47000pF 0.47μF
		16	0.22μF 1.0μF
		10	0.47μF 2.2μF
		6.3	2.2μF 10μF

8 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

LLA

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
LLA18	1.6X0.8 <0603>	4	0.10μF 2.2μF
LLA21	2.0X1.25 <0805>	25	10000pF 47000pF
		16	47000pF 0.22μF
		10	0.22μF 0.47μF
		6.3	0.47μF 1.0μF
		4	1.0μF 4.7μF

10 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

LLM

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
LLM21	2.0X1.25 <0805>	6.3	0.22μF 0.47μF
		4	1.0μF

Capacitors

LW Reversed Controlled ESR Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

LLR

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	ESR (mΩ)				Capacitance Range
			100	220	470	1000	
LLR18	0.8X1.6 <0306>	4	■	■	■	■	1.0μF

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

NFM

General Low ESL EMI FIL®

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
NFM15	1.0X0.5 <0402>	16	2200pF – 47000pF
		10	2200pF – 0.22μF
		6.3	0.10μF – 0.47μF
		4	0.47μF – 1.0μF
		2.5	4.3μF – 9.1μF
NFM18	1.6X0.8 <0603>	16	100pF – 0.10μF
		10	2.2μF
		6.3	0.22μF – 2.2μF
NFM21	2.0X1.25 <0805>	50	220pF – 22000pF
		25	0.10μF
		16	0.22μF – 1.0μF
		10	1.0μF – 4.7μF
		6.3	2.2μF – 10μF
NFM3D	3.2X1.25 <1205>	50	220pF – 22000pF
NFM31	3.2X1.6 <1206>	100	10000pF – 0.10μF
		50	10000pF – 0.10μF
		6.3	27μF
NFM41	4.5X1.6 <1806>	100	470pF – 22000pF
		50	0.20μF – 1.5μF
		25	1.5μF

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose

KRM

General Deflecting crack Soldering crack Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KRM21	2.2X1.25	25	10μF – 22μF
		16	10μF
KRM31	3.5X1.7	100	1.0μF
		50	4.7μF
		35	10μF
		25	10μF
	3.6X1.7	50	2.2μF
	3.7X1.85	100	2.2μF
KRM55	6.1X5.3	1k	68000pF – 0.22μF
		630	0.15μF – 0.47μF
		450	0.33μF – 1μF

Continued on the following page. ↗

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KRM55	6.1X5.3	250	0.68µF – 2.2µF
		100	4.7µF – 22µF
		63	4.7µF – 22µF
		50	4.7µF – 33µF
		35	10µF – 47µF
		25	15µF – 100µF

High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose

KR3

General | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KR355	6.1X5.3	630	0.10µF – 0.56µF
		450	0.22µF – 1.2µF
		250	0.47µF – 2.2µF

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose

GMA

General | Bonding

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GMA0D	0.38X0.38 <015015>	10	1000pF – 10000pF
GMA05	0.5X0.5 <0202>	100	100pF – 1000pF
		25	1500pF – 4700pF
		10	6800pF – 22000pF
		6.3	0.10µF
GMA08	0.8X0.8 <0303>	100	1500pF – 6800pF
		25	10000pF – 22000pF
		10	33000pF – 0.10µF
		6.3	0.47µF

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose

GMD

General | Bonding

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GMD03	0.6X0.3 <0201>	25	100pF – 1500pF
		16	1800pF – 3300pF
		10	3900pF – 10000pF
		6.3	56000pF – 0.10µF
GMD15	1.0X0.5 <0402>	50	220pF – 4700pF
		25	5600pF – 47000pF
		16	56000pF – 0.10µF
		10	0.12µF – 0.47µF

Ceramic capacitors SMD type For Automotive

AEC-Q200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment

Temperature Compensating Type

GRT

Info-tainment AEC-Q200

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRT15	1.0X0.5 <0402>	100	1.0pF – 100pF
		50	1.0pF – 1000pF
		25	10pF – 1000pF
GRT18	1.6X0.8 <0603>	100	1.0pF – 1500pF
		50	1.0pF – 10000pF
		25	560pF – 10000pF

High Dielectric Constant Type

GRT

Info-tainment AEC-Q200

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRT03	0.6X0.3 <0201>	35	0.10µF
		25	100pF – 0.10µF
		16	10000pF – 0.10µF
		10	2200pF – 0.22µF
		6.3	2200pF – 1.0µF
		4	68000pF – 1.0µF
GRT15	1.0X0.5 <0402>	50	220pF – 0.10µF
		35	0.22µF – 1.0µF
		25	10000pF – 2.2µF
		16	10000pF – 2.2µF
		10	0.22µF – 4.7µF
		6.3	22000pF – 4.7µF
		4	1.0µF – 4.7µF
		2.5	10µF
GRT18	1.6X0.8 <0603>	50	1.0µF – 2.2µF
		35	1.0µF – 4.7µF
		25	1.0µF – 10µF
		16	1.0µF – 10µF
		10	1.0µF – 22µF
		6.3	1.0µF – 22µF
		4	1.0µF – 22µF
		2.5	22µF
GRT21	2.0X1.25 <0805>	50	1.0µF – 4.7µF
		35	2.2µF – 4.7µF
		25	2.2µF – 22µF
		16	2.2µF – 22µF
		10	4.7µF – 22µF
		6.3	4.7µF – 47µF
		4	47µF
GRT31	3.2X1.6 <1206>	50	10µF
		35	10µF
		25	10µF – 22µF
		16	22µF
		10	22µF – 47µF

Continued on the following page. ↗

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRT31	3.2X1.6 <1206>	6.3	22µF 47µF
		4	22µF 47µF
GRT32	3.2X2.5 <1210>	25	10µF
		16	47µF
		10	47µF
		6.3	33µF 100µF

Chip Multilayer Ceramic Capacitors for Automotive

Temperature Compensating Type

GCM

Power-train AEC-Q200

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM03	0.6X0.3 <0201>	50	1.0pF 100pF
		25	1.0pF 100pF
GCM15	1.0X0.5 <0402>	50	1.0pF 1000pF
GCM18	1.6X0.8 <0603>	100	1.0pF 10000pF
		80	1800pF 3900pF
		50	1.0pF 10000pF
GCM21	2.0X1.25 <0805>	630	10pF 1200pF
		250	10pF 5600pF
		100	100pF 3300pF
		80	3900pF 22000pF
GCM31	3.2X1.6 <1206>	1k	10pF 1000pF
		630	10pF 4700pF
		250	10pF 15000pF
GCM32	3.2X2.5 <1210>	1k	1200pF 2200pF
		630	1200pF 10000pF
GCM43	4.5X3.2 <1812>	1k	2700pF 4700pF
		630	12000pF 22000pF
GCM55	5.7X5.0 <2220>	1k	5600pF 10000pF
		630	27000pF 47000pF

High Dielectric Constant Type

GCM

Power-train AEC-Q200

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM03	0.6X0.3 <0201>	25	100pF 3300pF
		16	330pF 3300pF
		10	4700pF 10000pF
GCM15	1.0X0.5 <0402>	100	220pF 4700pF
		50	220pF 0.10µF
		25	10000pF 0.10µF
		16	33000pF 0.22µF
		10	0.47µF 1.0µF
GCM18	1.6X0.8 <0603>	100	1000pF 22000pF
		50	0.22µF
		25	0.22µF 1.0µF
		16	0.33µF 1.0µF
		6.3	2.2µF
GCM21	2.0X1.25 <0805>	100	6800pF 1.0µF

Continued on the following page. ↗

Capacitors

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM21	2.0X1.25 <0805>	50	0.22µF – 1.0µF
		35	0.68µF – 4.7µF
		25	0.22µF – 4.7µF
		16	1.0µF – 10µF
		10	2.2µF – 10µF
		6.3	10µF
GCM31	3.2X1.6 <1206>	100	0.22µF – 2.2µF
		50	0.33µF – 4.7µF
		25	4.7µF – 10µF
		16	4.7µF – 10µF
		10	10µF – 22µF
		6.3	22µF
GCM32	3.2X2.5 <1210>	100	4.7µF
		50	4.7µF – 10µF
		35	10µF
		25	10µF – 22µF
		16	10µF – 22µF
		10	22µF
		6.3	47µF

High Effective Capacitance & High Ripple Current Chip Multilayer Ceramic Capacitors for Automotive

GC3

Power-train | AEC-Q200 | Anti-noise

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GC321	2.0X1.25 <0805>	250	10000pF – 22000pF
GC331	3.2X1.6 <1206>	630	10000pF – 15000pF
		450	10000pF – 47000pF
		250	33000pF – 68000pF
GC332	3.2X2.5 <1210>	630	22000pF – 47000pF
		450	68000pF – 0.10µF
		250	0.10µF – 0.15µF
GC343	4.5X3.2 <1812>	630	68000pF
		450	0.15µF
		250	0.22µF – 0.33µF
GC355	5.7X5.0 <2220>	630	0.10µF – 0.22µF
		450	0.22µF – 0.47µF
		250	0.47µF – 1.0µF

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive

GCJ

Power-train | AEC-Q200 | Fail safe | Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCJ18	1.6X0.8 <0603>	100	1000pF – 0.10µF
		50	1000pF – 0.22µF
		35	33000pF – 68000pF
		25	1000pF – 1.0µF

Continued on the following page. ↗

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCJ18	1.6X0.8 <0603>	16	10000pF – 0.47µF
		10	0.12µF – 0.22µF
		6.3	2.2µF – 4.7µF
GCJ21	2.0X1.25 <0805>	250	1000pF – 22000pF
		100	220pF – 1.0µF
		50	27000pF – 1.0µF
		35	0.12µF – 0.47µF
		25	0.10µF – 2.2µF
		16	0.27µF – 4.7µF
		10	2.2µF – 10µF
GCJ31	3.2X1.6 <1206>	1k	1000pF – 10000pF
		630	1000pF – 22000pF
		250	15000pF – 0.10µF
		100	0.22µF – 1.0µF
		50	0.47µF – 4.7µF
		35	0.56µF – 1.0µF
		25	2.2µF – 10µF
		16	3.3µF – 10µF
		10	6.8µF – 22µF
		6.3	22µF
GCJ32	3.2X2.5 <1210>	1k	15000pF – 22000pF
		630	6800pF – 47000pF
		250	68000pF – 0.22µF
		100	2.2µF – 4.7µF
		50	4.7µF – 10µF
		25	4.7µF – 22µF
		16	6.8µF – 22µF
		6.3	47µF
GCJ43	4.5X3.2 <1812>	1k	33000pF – 47000pF
		630	33000pF – 0.10µF
		250	0.15µF – 0.47µF
GCJ55	5.7X5.0 <2220>	1k	68000pF – 0.10µF
		630	0.10µF – 0.22µF
		250	0.33µF – 1.0µF

High Q Chip Multilayer Ceramic Capacitors for Automotive

GCQ

Power-train | AEC-Q200 | High Q

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCQ15	1.0X0.5 <0402>	50	0.10pF – 47pF

Capacitors

MLSC Design Chip Multilayer Ceramic Capacitors for Automotive

GCD

Power-train | AEC-Q200 | Fail safe | Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCD18	1.6X0.8 <0603>	100	1000pF – 22000pF
		50	1000pF – 22000pF
		25	27000pF – 47000pF
GCD21	2.0X1.25 <0805>	100	1000pF – 0.10μF
		50	15000pF – 0.10μF
		16	0.47μF

Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive

GCE

Power-train | AEC-Q200 | Fail safe | Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCE18	1.6X0.8 <0603>	100	1000pF – 22000pF
		50	1000pF – 22000pF
		25	27000pF – 47000pF
GCE21	2.0X1.25 <0805>	100	220pF – 0.10μF
		50	15000pF – 0.10μF

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive

NFM

Power-train | AEC-Q200 | Low ESL | EMI FIL®

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
NFM21	2.0X1.25 <0805>	50	220pF – 22000pF
		16	1.0μF
		10	0.10μF – 0.47μF
NFM31	3.2X1.6 <1206>	100	10000pF
		50	10000pF – 0.10μF

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive

KCM

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KCM55	6.1X5.3	100	4.7μF – 22μF
		63	4.7μF – 22μF
		50	4.7μF – 33μF
		35	10μF – 47μF
		25	15μF – 100μF

High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for Automotive

KC3

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KC355	6.1X5.3	630	0.10μF – 1.2μF
		450	0.22μF – 2.2μF
		250	0.47μF – 2.2μF

Safety Standard Certified Metal Terminal Type Multilayer Ceramic Capacitors for Automotive

KCA Type MF

Power-train | AEC-Q200 | Safety standard | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (V)	Capacitance Range (F)
KCA55	6.1X5.3	AC250 (r.m.s.)	100pF – 10000pF

Ni Plating + Pd Plating termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive

GCB

Power-train | AEC-Q200 | Deflecting crack | Soldering crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCB15	1.0X0.5 <0402>	100	1000pF – 10000pF
		50	1000pF – 47000pF
		25	1000pF – 0.10μF
		16	15000pF – 0.10μF
		10	3300pF – 0.10μF

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive

Temperature Compensating Type

GCG

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Limited to conductive glue mounting

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCG15	1.0X0.5 <0402>	50	120pF – 470pF
GCG18	1.6X0.8 <0603>	50	10pF – 2200pF
GCG21	2.0X1.25 <0805>	50	1000pF – 10000pF

Continued on the following page. ↗

Capacitors

High Dielectric Constant Type

GCG

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Limited to conductive glue mounting

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCG15	1.0X0.5 <0402>	50	220pF – 4700pF
		25	5600pF – 10000pF
		16	15000pF – 0.10μF
GCG18	1.6X0.8 <0603>	100	1000pF – 0.10μF
		50	220pF – 0.22μF
		25	1000pF – 0.47μF
		16	68000pF – 1.0μF
		10	2.2μF
		6.3	2.2μF
GCG21	2.0X1.25 <0805>	100	10000pF
		50	0.10μF – 1.0μF
		35	0.68μF – 1.0μF
		25	0.22μF – 1.0μF
		16	0.33μF – 4.7μF
		10	10μF
		6.3	10μF
GCG31	3.2X1.6 <1206>	50	0.22μF – 0.33μF
		25	0.22μF – 4.7μF
		16	0.68μF – 4.7μF
		6.3	22μF
GCG32	3.2X2.5 <1210>	50	10μF
		35	10μF
		25	3.3μF – 10μF
		16	6.8μF – 10μF
		6.3	47μF

Ceramic capacitors SMD type For Medical Devices

Chip Multilayer Ceramic Capacitors for Implantable Medical Devices (Non Life Support Circuit)

Temperature Compensating Type

GCH

Medical Device

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCH15	1.0X0.5 <0402>	50	1.0pF – 1000pF
GCH18	1.6X0.8 <0603>	100	1.0pF – 1500pF
		50	1.0pF – 3300pF
GCH21	2.0X1.25 <0805>	100	100pF – 3300pF
		50	1000pF – 22000pF
GCH31	3.2X1.6 <1206>	100	2200pF – 10000pF
		50	4700pF – 47000pF

Continued on the following page. ↗

Temperature Compensating Type

GCH

Medical Device

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCH15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.10μF
		25	10000pF – 47000pF
		16	47000pF – 0.22μF
		10	0.10μF – 1.0μF
GCH18	1.6X0.8 <0603>	100	1000pF – 22000pF
		50	1000pF – 0.22μF
		25	47000pF – 1.0μF
		16	0.10μF – 1.0μF
		10	2.2μF
		6.3	2.2μF
GCH21	2.0X1.25 <0805>	100	10000pF – 1.0μF
		50	47000pF – 1.0μF
		35	1.0μF – 4.7μF
		25	0.22μF – 4.7μF
		16	1.0μF – 4.7μF
		10	2.2μF – 10μF
		6.3	10μF
GCH31	3.2X1.6 <1206>	100	0.10μF – 1.0μF
		50	0.47μF – 2.2μF
		25	2.2μF – 4.7μF
		16	4.7μF – 10μF
		10	10μF
GCH32	3.2X2.5 <1210>	50	1.0μF – 4.7μF
		25	4.7μF
		16	10μF
		10	22μF
		6.3	47μF

Ceramic capacitors lead type For General Purpose

Leaded MLCC for General Purpose

Temperature Compensating Type

RDE

General | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDE5C	4.0X3.5	100	1.0pF – 1500pF
		50	1.0pF – 3900pF
	4.5X3.5	100	1800pF – 3300pF
		50	4700pF – 22000pF
	5.0X3.5	100	1.0pF – 3300pF
		50	1.0pF – 22000pF
	5.5X4.0	1k	10pF – 1000pF
		630	10pF – 3300pF

Continued on the following page. ↗

Capacitors

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDE5C	5.5X4.0	250	10pF – 15000pF
		100	3900pF – 22000pF
		50	27000pF – 56000pF
RDE7U	4.5X3.5	250	100pF – 4700pF
	5.5X4.0	1k	10pF – 1000pF
		630	10pF – 4700pF
		250	6800pF – 22000pF
	5.5X5.0	1k	1500pF – 2200pF
		630	6800pF – 10000pF
		250	33000pF – 47000pF
	7.5X5.5	1k	3300pF – 4700pF
		630	15000pF – 22000pF
	7.5X8.0	1k	6800pF – 10000pF
		630	33000pF – 47000pF
	7.7X13.0	1k	20000pF
		630	94000pF

High Dielectric Constant Type

RDE RDE RDE

General | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDEC7	4.0X3.5	25	0.22μF – 1.0μF
	4.5X3.5	50	1.0μF
		25	2.2μF
	5.0X3.5	50	1.0μF
		25	0.22μF – 2.2μF
	5.5X4.0	50	4.7μF
		25	4.7μF – 10μF
	5.5X5.0	100	1.5μF – 2.2μF
		50	10μF
		25	22μF
	5.5X7.5	100	4.7μF
		50	22μF
		25	47μF
RDED7	5.5X4.0	630	10000pF – 15000pF
		450	10000pF – 47000pF
		250	33000pF – 68000pF
	5.5X5.0	630	22000pF – 47000pF
		450	68000pF – 0.10μF
		250	0.10μF – 0.15μF
	7.5X5.5	630	68000pF
		450	0.15μF
		250	0.22μF – 0.33μF
	7.5X7.5	450	0.22μF – 0.56μF
		250	0.47μF – 1.0μF
	7.5X8.0	630	0.10μF – 0.27μF
	7.7X12.5	450	1.0μF – 1.2μF
		250	2.2μF
	7.7X13.0	630	0.47μF – 0.56μF
RDER7	4.0X3.5	100	220pF – 22000pF
		50	220pF – 0.1μF
		25	0.1μF
	4.5X3.5	500	1000pF – 10000pF

Continued on the following page. ↗

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDER7	4.5X3.5	250	1000pF – 22000pF
		100	33000pF – 0.47μF
		50	0.15μF – 0.47μF
	5.0X3.5	100	220pF – 0.47μF
		50	220pF – 0.47μF
		25	0.1μF
	5.5X4.0	1k	470pF – 10000pF
		630	1000pF – 22000pF
		500	15000pF – 47000pF
		250	33000pF – 0.10μF
		100	0.15μF – 1.0μF
		50	0.68μF – 2.2μF
	5.5X5.0	1k	15000pF – 22000pF
		630	33000pF – 47000pF
		500	68000pF – 0.10μF
		250	0.15μF – 0.22μF
		50	3.3μF
	7.5X5.5	1k	33000pF – 47000pF
		630	68000pF – 0.10μF
		500	0.15μF – 0.22μF
		250	0.33μF – 0.47μF
	7.5X7.5	500	0.33μF – 0.47μF
		250	0.68μF – 1.0μF
	7.5X8.0	1k	68000pF – 0.10μF
		630	0.15μF – 0.22μF
	7.7X12.5	500	0.68μF – 1.0μF
		250	2.2μF
	7.7X13.0	1k	0.22μF
		630	0.47μF

High Voltage Lead Type Disc Ceramic Capacitors for General Purpose

DHR

General | Deflecting crack | Soldering crack

Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
DHR4E	8.0 to 18.0	15k	100pF – 1000pF
	8.0 to 16.0	12k	100pF – 1000pF
	8.0 to 15.0	10k	100pF – 1000pF
DHRB3	8.0 to 18.0	15k	100pF – 1000pF
	8.0 to 16.0	12k	100pF – 1000pF
	8.0 to 15.0	10k	100pF – 1000pF

Based on the Electrical Appliance and Material Safety Law of Japan Lead Type Disc Ceramic Capacitors for General Purpose

DEJ

General | Japanese Safety Law

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F)
DEJE3	7.0 to 11.0	AC250 (r.m.s.)	1000pF – 4700pF
DEJF3	8.0 to 11.0	AC250 (r.m.s.)	4700pF – 10000pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose / IEC60384-14 Class X1/Y1

DE1 Type RA

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DE11X	6.0 to 9.0	AC500 (r.m.s.)	10pF – 68pF
DE1B3	6.0 to 9.0	AC500 (r.m.s.)	100pF – 680pF
DE1E3	8.0 to 14.0	AC500 (r.m.s.)	1000pF – 4700pF
DE11X	6.0 to 8.0	AC300 (r.m.s.)	10pF – 68pF
	6.0 to 8.0	AC250 (r.m.s.)	10pF – 68pF
DE1B3	6.0 to 8.0	AC300 (r.m.s.)	100pF – 680pF
	6.0 to 8.0	AC250 (r.m.s.)	100pF – 680pF
DE1E3	7.0 to 12.0	AC300 (r.m.s.)	1000pF – 4700pF
	7.0 to 12.0	AC250 (r.m.s.)	1000pF – 4700pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose / IEC60384-14 Class X1/Y1

DE1 Type KX

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DE11X	9.0	AC250 (r.m.s.)	10pF – 68pF
DE1B3	7.0 to 8.0	AC300 (r.m.s.)	100pF – 680pF
	7.0 to 8.0	AC250 (r.m.s.)	100pF – 680pF
DE1E3	7.0 to 12.0	AC300 (r.m.s.)	1000pF – 4700pF
	7.0 to 12.0	AC250 (r.m.s.)	1000pF – 4700pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose / IEC60384-14 Class X1/Y2

DE2 Type SA

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DE21X	6.0 to 9.0	AC400 (r.m.s.)	10pF – 68pF
DE2B3	6.0 to 8.0	AC400 (r.m.s.)	100pF – 680pF
DE2E3	7.0 to 17.0	AC400 (r.m.s.)	1000pF – 10000pF
DE21X	6.0 to 8.0	AC300 (r.m.s.)	10pF – 68pF
	6.0 to 8.0	AC250 (r.m.s.)	10pF – 68pF
DE2B3	6.0 to 7.0	AC300 (r.m.s.)	100pF – 680pF
	6.0 to 7.0	AC250 (r.m.s.)	100pF – 680pF
DE2E3	6.0 to 15.0	AC300 (r.m.s.)	1000pF – 10000pF
	6.0 to 15.0	AC250 (r.m.s.)	1000pF – 10000pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose / IEC60384-14 Class X1/Y2

DE2 Type KY

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DE21X	8.0	AC250 (r.m.s.)	10pF – 68pF
DE2B3	7.0 to 8.0	AC300 (r.m.s.)	100pF – 680pF
	7.0 to 8.0	AC250 (r.m.s.)	100pF – 680pF
DE2E3	7.0 to 10.0	AC300 (r.m.s.)	1000pF – 4700pF
	7.0 to 10.0	AC250 (r.m.s.)	1000pF – 4700pF
DE2F3	14.0	AC300 (r.m.s.)	10000pF
	14.0	AC250 (r.m.s.)	10000pF

Ceramic capacitors lead type For Automotive

Leaded MLCC for Automotive

Temperature Compensating Type

RCE

Power-train AEC-Q200 Deflecting crack Soldering crack Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
RCE5C	3.6X3.5	100	1.0pF – 1500pF
		50	1.0pF – 3900pF
	4.0X3.5	100	1800pF – 3300pF
		50	4700pF – 22000pF
	5.5X4.0	1k	10pF – 1000pF
		630	10pF – 3300pF
		250	10pF – 15000pF
		100	3900pF – 10000pF
		50	27000pF – 56000pF
RCE7U	4.0X3.5	250	100pF – 4700pF
	5.5X4.0	1k	10pF – 1000pF
		630	10pF – 4700pF
		250	6800pF – 10000pF
	5.5X5.0	1k	1500pF – 2200pF
		630	6800pF – 10000pF
	7.5X5.5	1k	3300pF – 4700pF
		630	15000pF – 22000pF
	7.5X8.0	1k	6800pF – 10000pF
		630	33000pF – 47000pF
	7.7X13.0	1k	20000pF
		630	94000pF

Continued on the following page. ↗

Capacitors

High Dielectric Constant Type

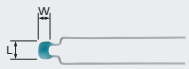
RCE

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RCEC7	4.0X3.5	50	1.0µF
	5.5X4.0	50	4.7µF
	5.5X5.0	100	1.5µF 2.2µF
		50	10µF
	5.5X7.5	100	4.7µF
		50	22µF
RCER7	3.6X3.5	100	220pF 22000pF
		50	220pF 0.10µF
		25	0.10µF 0.22µF
	4.0X3.5	250	1000pF 22000pF
		100	33000pF 0.33µF
		50	0.15µF 0.47µF
		25	0.33µF 1.0µF
	5.5X4.0	1k	1000pF 10000pF
		630	1000pF 22000pF
		250	33000pF 0.10µF
		100	0.15µF 1.0µF
		50	0.68µF 2.2µF
		25	1.5µF 4.7µF
	5.5X5.0	1k	15000pF 22000pF
		630	33000pF 47000pF
		250	0.15µF 0.22µF
		50	3.3µF 4.7µF
		25	10µF
	5.5X7.5	50	10µF
		25	22µF
	7.5X5.5	1k	33000pF 47000pF
		630	68000pF 0.10µF
		250	0.33µF 0.47µF
	7.5X7.5	250	0.68µF 1.0µF
	7.5X8.0	1k	68000pF 0.10µF
		630	0.15µF 0.22µF
	7.7X12.5	250	2.2µF
	7.7X13.0	1k	0.22µF
		630	0.47µF

150°C Operation Leaded MLCC for Automotive

Temperature Compensating Type



RHE

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RHE5G	3.6X3.5	100	100pF 1500pF
		50	100pF 3900pF
	4.0X3.5	100	1800pF 3300pF
		50	4700pF 10000pF

Continued on the following page. ↗

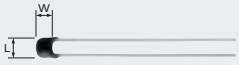
High Dielectric Constant Type

RHE

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

Series	LxW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RHEL8	3.6X3.5	100	220pF – 22000pF
		50	220pF – 0.10μF
		25	0.10μF – 0.22μF
	4.0X3.5	100	33000pF – 0.10μF
		50	0.15μF – 0.33μF
		25	0.33μF – 1.0μF
	5.5X4.0	100	0.15μF – 0.22μF
		50	0.47μF – 2.2μF
		25	1.5μF – 4.7μF
	5.5X5.0	50	3.3μF – 4.7μF
		25	10μF
	5.5X7.5	50	10μF
		25	22μF

175°C/200°C Operation Leaded MLCC for Automotive



RHS

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

Series	LxW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RHS7J	4.0X3.5	200	100pF – 4700pF
	5.0X4.0	500	100pF – 4700pF
		200	6800pF – 10000pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive

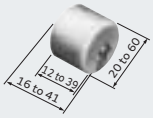
DE6 Type KJ

Power-train | AEC-Q200 | Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F)
DE6B3	8.0 to 9.0	AC300 (r.m.s.)	100pF – 680pF
DE6E3	7.0 to 12.0	AC300 (r.m.s.)	1000pF – 4700pF

Ceramic capacitors screw termination type

Ultra High Voltage DC Rated Screw Terminal Type Ceramic Capacitors for General Purpose



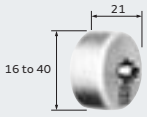
DHS

(in mm)

General

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DHS4E	-	40k	140pF – 2000pF
		30k	190pF – 2700pF
		20k	280pF – 4000pF
		15k	370pF – 5300pF
		10k	560pF – 8000pF
DHSF4	-	40k	340pF – 2700pF
		30k	460pF – 3600pF
		20k	600pF – 4800pF

Ultra High Voltage AC Rated Screw Terminal Type Ceramic Capacitors for General Purpose



DHK

(in mm)

General

Series	LXW (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DHK3V	-	AC10k (r.m.s.)	100pF – 1000pF

Resin Molding SMD Type Ceramic Capacitors

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose

Temperature Compensating Type

DK1 Type EA

General Safety standard

Series	LXW (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DK11X	11.4×6.0	AC300 (r.m.s.)	10pF – 47pF
		AC250 (r.m.s.)	10pF – 47pF

Continued on the following page. ↗

High Dielectric Constant Type

DK1 Type EA

General Safety standard

Series	LXW (mm)	Rated Voltage (V)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DK1B3	11.4X6.0	AC300 (r.m.s.)	100pF – 680pF
		AC250 (r.m.s.)	100pF – 680pF
DK1E3	11.4X6.0	AC300 (r.m.s.)	1000pF – 1500pF
		AC250 (r.m.s.)	1000pF – 1500pF

Polymer Aluminum Electrolytic Capacitors

ECAS

ECNS

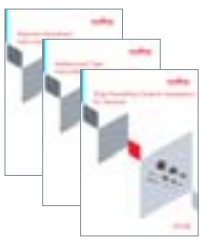
General Deflecting crack Anti-noise Effective Cap

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
ECAS	7.3X4.3	25	10μF – 33μF
		16	6.8μF – 68μF
		12.5	10μF – 100μF
		10	10μF – 150μF
		6.3	10μF – 330μF
		4	68μF – 330μF
		2.5	330μF – 470μF
		2	100μF – 560μF
ECNS	3.5X2.8	25	10μF – 15μF
		16	10μF – 33μF
		6.3	22μF – 100μF

Please refer to p. 80 for Supercapacitors (EDLC).

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.



- Chip Multilayer Ceramic Capacitors for General — Cat. No. C02E
- Chip Multilayer Ceramic Capacitors for Automotive — Cat. No. C03E
- Safety Standard Certified Ceramic Capacitors/ High Voltage Ceramic Capacitors — Cat. No. C85E
- Polymer Aluminum Electrolytic Capacitors — Cat. No. C90E
- Radial Lead Type Monolithic Ceramic Capacitors — Cat. No. C49E
- High Performance Supercapacitors (EDLC) DMF Series — Cat. No. O83E
- High Performance Supercapacitors (EDLC) DMT Series — Cat. No. O84E

Noise Suppression Products/ EMI Suppression Filters

Broad lineup of Noise Suppression Products and EMI Suppression Filters

Summary

Using Murata's ceramic processing technology and unique materials, we offer a variety of Noise Suppression Products and EMI Suppression Filters.

Lineup

- ●EMI (chip and lead type)
- ●Noise Suppression Products for Automotive
- ●ESD Protection Devices

Noise Suppression Filters (Chip Ferrite Bead)/ (Frequency Specified Filters)

			Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 100MHz (Rated Current)
For General Band Noise	Universal Type [Power Lines/Signal Lines]		BLM02AX	01005 (0402)	750	10Ω to 240Ω (0.2A to 0.75A)
			BLM03AX	0201 (0603)	1000	10Ω to 1000Ω (0.2A to 1A)
			BLM15AX	0402 (1005)	1740	10Ω to 1000Ω (0.35A to 1.74A)
	Signal Lines Type	For General Signal Lines	BLM03AG	0201 (0603)	-	10Ω to 1000Ω
			BLM15AG	0402 (1005)	-	10Ω to 1000Ω
			BLM18AG	0603 (1608)	-	120Ω to 1000Ω
			BLM21AG	0805 (2012)	-	120Ω to 1000Ω
			BLM18TG	0603 (1608)	-	120Ω to 1000Ω
			BLA2AA (4 circuits array)	0804 (2010)	-	120Ω to 1000Ω
			BLA31AG (4 circuits array)	1206 (3216)	-	30Ω to 1000Ω
		For High Speed Signal Lines	BLM02BX*	01005 (0402)	-	120Ω to 240Ω
			BLM03BX	0201 (0603)	-	1000Ω to 1800Ω
			BLM02B	01005 (0402)	-	10Ω to 240Ω
			BLM03B	0201 (0603)	-	10Ω to 600Ω
			BLM15B	0402 (1005)	-	5Ω to 1800Ω
			BLM18B	0603 (1608)	-	5Ω to 2500Ω
			BLM21B	0805 (2012)	-	5Ω to 2700Ω
			BLA2AB (4 circuits array)	0804 (2010)	-	10Ω to 1000Ω
			BLA31BD (4 circuits array)	1206 (3216)	-	120Ω to 1000Ω
		For Digital Interface Lines	BLM18RK	0603 (1608)	-	120Ω to 1000Ω
			BLM21RK	0805 (2012)	-	120Ω to 1000Ω

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Continued on the following page.↗

		Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 100MHz (Rated Current)
For General Band Noise	Power Lines Type	BLM02KX*	01005 (0402)	1500	10Ω to 18Ω (1.2A to 1.5A)
		BLM02PX*	01005 (0402)	1100	10Ω to 60Ω (0.5A to 1.1A)
		BLM03PX*	0201 (0603)	1800	22Ω to 80Ω (1A to 1.8A)
		BLM03PG	0201 (0603)	900	22Ω to 33Ω (0.75A to 0.9A)
		BLM15KD*	0402 (1005)	3800	20Ω to 120Ω (1.5A to 3.8A)
		BLM15PX*	0402 (1005)	3000	33Ω to 600Ω (0.9A to 3A)
		BLM15PD*	0402 (1005)	2200	30Ω to 120Ω (1.3A to 2.2A)
		BLM15PG	0402 (1005)	1000	10Ω (1A)
		BLM18PG*	0603 (1608)	3000	30Ω to 470Ω (1A to 3A)
		BLM21PG*	0805 (2012)	6000	22Ω to 330Ω (1.5A to 6A)
		BLM31PG*	1206 (3216)	6000	33Ω to 600Ω (1.5A to 6A)
		BLM41PG*	1806 (4516)	6000	60Ω to 1000Ω (1.5A to 6A)
		BLM18SN* (Low DC Resistance Type)	0603 (1608)	8000	22Ω (8A)
		BLM18KG* (Low DC Resistance Type)	0603 (1608)	6000	26Ω to 1000Ω (1.3A to 6A)
		BLM18SD* (Low DC Resistance Type)	0603 (1608)	6000	22Ω (6A)
		BLM18SG* (Low DC Resistance Type)	0603 (1608)	6000	26Ω to 330Ω (1.5A to 6A)
		BLM21SN* (Low DC Resistance Type)	0805 (2012)	8500	30Ω (8.5A)
		BLM31SN* (Low DC Resistance Type)	1206 (3216)	12000	50Ω (12A)
		BLM31KN*	1206 (3216)	6000	120Ω to 1000Ω (2A to 6A)
		BLE18PS*	0603 (1608)	8000	8Ω (8A)
		BLE32PN	1220 (3225)	10000	26Ω to 30Ω (10A)
For GHz Band Noise	Universal Type [Power Lines/Signal Lines]	BLM03EB*	0201 (0603)	600	25Ω to 50Ω (0.4A to 0.6A)
		BLM15EG*	0402 (1005)	1500	120Ω to 220Ω (0.7A to 1.5A)
		BLM15EX*	0402 (1005)	1800	120Ω to 470Ω (0.95A to 1.8A)
		BLM18EG*	0603 (1608)	2000	100Ω to 600Ω (0.5A to 2A)
		BLM18HE*	0603 (1608)	800	600Ω to 1500Ω (0.5A to 0.8A)
	Signal Lines Type	BLM03HG	0201 (0603)	-	600Ω to 1200Ω
		BLM03HD	0201 (0603)	-	330Ω to 1800Ω
		BLM03HB	0201 (0603)	-	190Ω to 400Ω
		BLM15HG	0402 (1005)	-	600Ω to 1000Ω
		BLM15HD	0402 (1005)	-	600Ω to 1800Ω
		BLM15HB	0402 (1005)	-	120Ω to 220Ω
		BLM18HG	0603 (1608)	-	470Ω to 1000Ω
		BLM18HD	0603 (1608)	-	470Ω to 1000Ω
		BLM18HB	0603 (1608)	-	120Ω to 330Ω
		BLM18HK	0603 (1608)	-	330Ω to 1000Ω
For High-GHz Band Noise	Signal Lines Type	BLM15GG	0402 (1005)	-	220Ω to 470Ω
		BLM15GA	0402 (1005)	-	75Ω
		BLM18GG	0603 (1608)	-	470Ω

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Continued on the following page. ↗

Noise Suppression Products/EMI Suppression Filters

	Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 700MHz
For 700MHz Band Noise Filter	BLF02JD*	01005 (0402)	-	360Ω to 470Ω
	BLF03JD*	0201 (0603)	-	420Ω

	Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 2.4GHz
For 2.4GHz Band Noise Filter	BLF02RD*	01005 (0402)	-	330Ω to 470Ω

		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 100MHz (Rated Current)
For General Band Noise	Large Current Type Power Lines Type	BLT5BPT*	2020 (5050)	11	68Ω (11A)

Noise Suppression Filters (Feed Through Chip EMI Filters)

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Capacitance
Universal Type [Power Lines/Signal Lines]	NFE31PT	1206 (3216)	6000	22pF to 2200pF
	NFE61PT	2706 (6816)	2000	33pF to 4700pF

Noise Suppression Filters (Chip LC Filters)

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Cut-off Frequency
Signal Lines Type	NFL15ST	0402 (1005)	-	150MHz to 500MHz
	NFL18ST	0603 (1608)	-	50MHz to 500MHz
	NFL18SP	0603 (1608)	-	150MHz to 500MHz
	NFL21SP	0805 (2012)	-	10MHz to 500MHz
	NFA18SL (4 circuits array)	0603 (1608)	-	50MHz to 480MHz
	NFA18SD (4 circuits array)	0603 (1608)	-	180MHz to 200MHz
	NFA21SL (4 circuits array)	0805 (2012)	-	50MHz to 330MHz
	NFW31SP	1206 (3216)	-	10MHz to 500MHz

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Noise Suppression Filters (Chip EMIFIL®)

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 900MHz	Impedance at 1.7GHz
For Audio Lines	NFZ15SG_10	0402 (1005)	500	770Ω to 4600Ω	900Ω to 1800Ω
	NFZ15SG_11	0402 (1005)	1100	100Ω to 330Ω	160Ω to 540Ω

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 100MHz
For Audio Lines	NFZ32SW_10	1210 (3225)	-	300Ω to 900Ω
	NFZ15SM_10*	0402 (1005)	-	70Ω to 220Ω
	NFZ18SM_10	0603 (1608)	-	120Ω to 700Ω
	NFZ2MSM_10	0806 (2016)	-	100Ω to 600Ω

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 1MHz
For LED Lines	NFZ5BBW_LN10*	2020 (5050)	4000	2.9Ω to 140Ω
	NFZ2HBM_10	1008 (2520)	1200	1.5Ω to 60Ω
	NFZ32BW_10*	1210 (3225)	2550	3.6Ω to 880Ω
	NFZ32BW_11*	1210 (3225)	2900	3.3Ω to 150Ω

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Noise Suppression Filters (Chip Common Mode Choke Coils/ Chip Common Mode Noise Filters)

		Series	Size Code inch (mm)	Max. Rated Current (mA)	Common Mode Impedance at 100MHz
Signal Lines Type	For Audio Lines	DLM11G	0504 (1210)	-	600Ω
	For Ultra-High-Speed Signal Lines	DLM0QSN	025020 (0605)	-	50Ω to 90Ω
		DLM0QSB	025020 (0605)	-	12Ω to 35Ω
		DLM0NSN	03025 (0806)	-	50Ω to 90Ω
		DLM0NSB	03025 (0806)	-	12Ω to 28Ω
		DLM11S	0504 (1210)	-	45Ω to 90Ω
		NFP0RSN	018012 (0403)	-	(65Ω) to (90Ω)
		NFP0QHB	025020 (0605)	-	-
		NFP0QSB	025020 (0605)	-	(90Ω)
		NFP0NCN	03025 (0806)	-	(30Ω) to (65Ω)
		DLP0RSN	018012 (0403)	-	65Ω to 90Ω
		DLP0QSA	025020 (0605)	-	7Ω to 35Ω
		DLP0NSC	03025 (0806)	-	28Ω to 90Ω
		DLP0NSN	03025 (0806)	-	35Ω to 120Ω
		DLP0NSA	03025 (0806)	-	7Ω to 15Ω
		DLP11SN	0504 (1210)	-	67Ω to 330Ω
		DLP11SA	0504 (1210)	-	35Ω to 90Ω
		DLP11RN	0504 (1210)	-	45Ω
		DLP11RB	0504 (1210)	-	15Ω to 40Ω
		DLP11TB	0504 (1210)	-	80Ω
		DLP31S	1206 (3216)	-	120Ω to 550Ω
		DLP1NDN (2 circuits array)	05025 (1506)	-	35Ω to 90Ω
		DLP2ADA (2 circuits array)	0804 (2010)	-	35Ω to 90Ω
		DLP2ADN (2 circuits array)	0804 (2010)	-	67Ω to 280Ω
		DLP31DN (2 circuits array)	1206 (3216)	-	90Ω to 440Ω
		DLW21S	0805 (2012)	-	67Ω to 920Ω
		DLW21H	0805 (2012)	-	67Ω to 180Ω
		DLW31SN	1206 (3216)	-	90Ω to 2200Ω
Universal Type [Power Lines/Signal Lines]		DLW44S*	1515 (4040)	3100	(100Ω) to (2400Ω)
		DLW5AH/DLW5BS*	2014 (5036) / 2020 (5050)	5000	(190Ω) to (4000Ω)
		DLW5AT*/DLW5BT*	2014 (5036) / 2020 (5050)	6000	(50Ω) to (2700Ω)

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Continued on the following page.↗

	Series	Size Code inch (mm)	Max. Rated Current (A)	Common Mode Impedance at 10MHz
Large Current Type for Automotive Available	 PLT5BPH*	2020 (5050)	5.6	100Ω to 500Ω
	 PLT10HH*	-	18	45Ω to 1000Ω

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Common Mode Impedance at 100MHz
Large Current Type for Automotive Available	 UCMH0907	3527 (9070)	5000	(700Ω)

Noise Suppression Filters (Block Type)

		Series	Height (mm)	Rated Voltage (Vdc)	Rated Current (A)
Power Lines Type	SMD Type	 BNX022*	3.1	50	20
		 BNX023*	3.1	100	20
		 BNX024*	3.5	50	20
		 BNX025*	3.5	25	20
		 BNX026*	3.5	50	20
		 BNX027*	3.5	16	20
		 BNX028*	3.5	16	20
		 BNX029*	3.5	6.3	20
	Lead Type	 BNX003	13 max.	150	10
		 BNX005	13.5 max.	50	15
		 BNX012*	8.5 max.	50	15
		 BNX016*	8.5 max.	25	15

* The derating of rated current is required for some items according to the operating temperature.
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ESD Protection Devices

Support ESD protection for various kinds of electronic devices.

Ceramic ESD Protection Devices LXES_A Series

Applying Murata's original ceramic technology for excellent ESD suppression performance and ultra-small capacitance value.

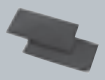

Silicon ESD Protection Devices LXES_T Series

Applying accumulated design technology for excellent ESD suppression performance.


ESD Protection Devices with Common Mode Choke Coil LXES_D Series

Applying Murata's original ceramic technology for excellent ESD suppression performance, small capacitance value, and common mode filter performance.


Noise Suppression Filters (Lead Type), Others

	Series				
Lead Type EMIFIL®	 BLL18AG	 BL01	 BL02	 BL03	 DSS1
EMIGUARD®	 VFC2H	 VFR3V	 VFS6V	 VFS9V	
Common Mode Choke Coils	 PLT09H				
Microwave Absorbers	 EA20/21/30				

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

▪ EMI Suppression Filters (Lead Type EMIFIL®)	Cat. No. C30E
▪ EMI Suppression Filters (for DC)/Chip Inductors for Automotive	Cat. No. C51E
▪ EMI Suppression Filters (EMIFIL®) for AC Power Lines	Cat. No. C09E
▪ Noise Suppression by EMIFIL® Digital Equipment Application Manual	Cat. No. C33E
▪ Noise Suppression by EMIFIL® Application Guide Application Manual	Cat. No. C35E
▪ Application Manual for Power Supply Noise Suppression and Decoupling for Digital ICs	Cat. No. C39E

Inductors (Coils)

Broad Lineup of Chip Inductors and Power Inductors

Summary

Murata's chip inductors are optimally designed, making full use of multiple construction techniques, such as the multilayer construction technique, film construction technique, and the wire wound construction technique according to the application. We offer an extensive lineup of inductors for power supplies to high frequency.
In addition, newly adopted metal alloy material has extended the power inductor lineup.

Lineup

●Inductors for Power Lines ●RF Inductors
●General Circuits Inductors ●Lineup ●Variable Inductors

http://psearch.en.murata.com/inductor/partnumber/

WEB Product Search Engine

1 Search by part number or series name

The applicable inductors can be searched by part number or series name.

2 Search by specifications

Inductors can be searched by various specifications, such as the Inductance, DC Resistance, and Rated Current.

3 Search in the lineups

Inductor search using series lineup list is available.

Lineup chart-in Series page

4 Search by competitor's part number (Cross reference)

The Murata part number compatible with specification can be found using a competitor's part number.

Search results

The number of part numbers applicable to the current search conditions is always displayed in real time.

Click each search condition button to display the menu. The search results will change in real time with the selected conditions.

Clicking the "Current search conditions" opens a menu, and the filtered conditions can be checked.

The results can be sorted by clicking the ▲ button above the search results items.

Clicking the product name opens the details page, and more detailed information can be acquired.

The icons clearly indicate the status and the features of the product.

A simple specification sheet can be downloaded without opening the details page.

Inductors for Power Lines

Main Type:

▪ Wound Metal Alloy ▪ Multilayer Type ▪ Wound Ferrite Core

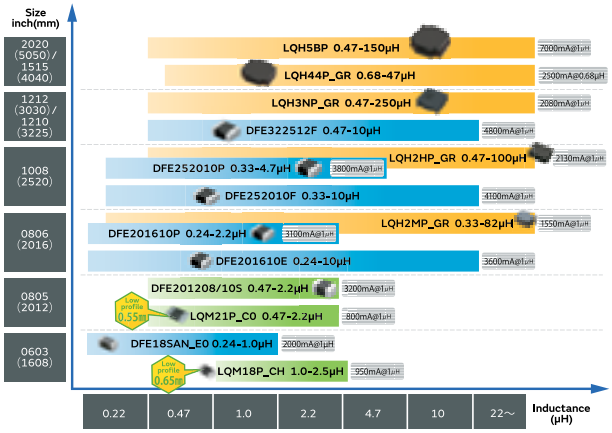
Metal alloy type inductors have been added to the inductor lineup!

We have an extensive lineup of inductors covering a wide range of sizes from 1.6 mm x 0.8 mm to 12 mm square, which are manufactured using multiple techniques that include metal alloy wire wound construction technique and ferrite multilayer technique. We offer the optimum inductors for a wide range of applications including wearable devices, smartphones, medical applications, industrial electronics, and on board devices.

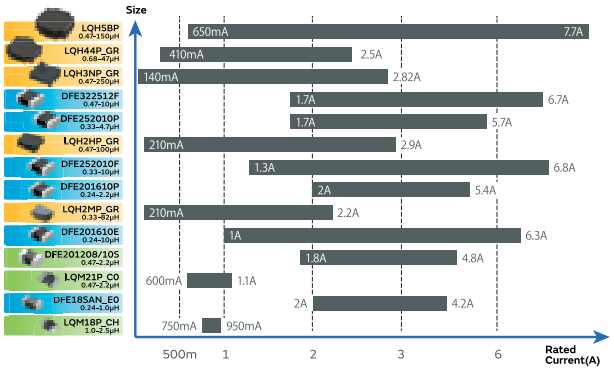
Structure	Description	Series
Wound Metal Alloy	Supports high current by using metal materials in which magnetic saturation does not occur so easily. This product can be used for a wide range of high current power circuits from smart phones to industrial electronics and automotive device applications.	DFEC/DFES series DFEG/DFEH series FDSD series
Multilayer Type	The features of this product is its small size and low profile. For example, 2012 or smaller footprint and 0.6mm height. This is ideal for low power circuits, including wearable devices and smartphones.	LQM series
Wound Ferrite Core	A feature of this product is the extensive lineup which supports an inductance of 100 µH or more. It is suitable for step-up power supply circuits in backlights, and choke applications.	LQH series MDH series DEM series

Recommended Lineup (General)

List of inductance values

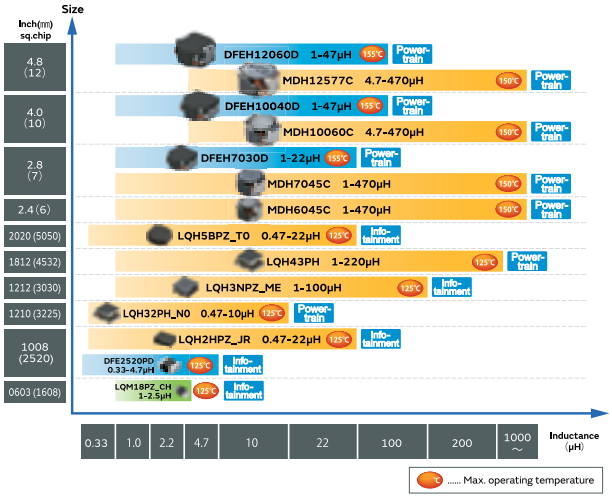


List of rated current values

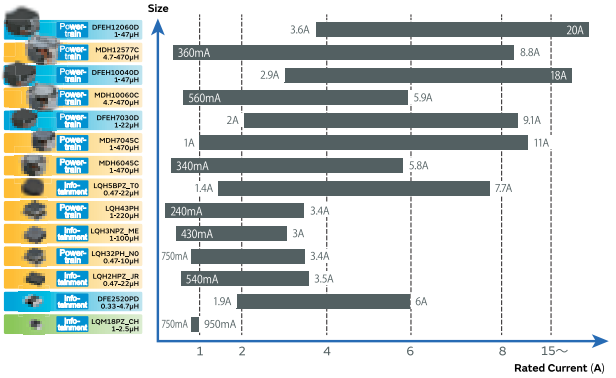


Recommended Lineup (For Automotive)

List of inductance values



List of rated current values



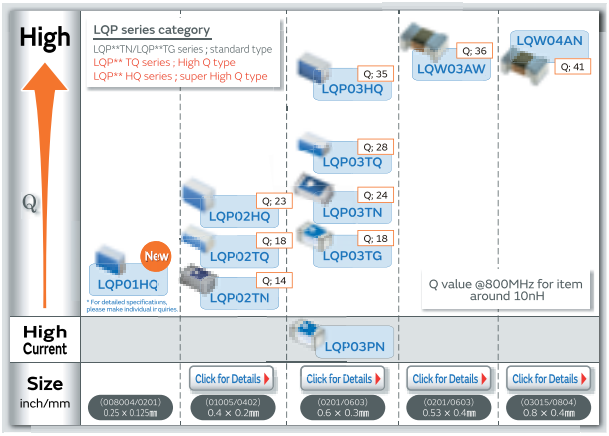
RF Inductors

Main Type:
▪ Film Type ▪ Wire Wound Type ▪ Multilayer Type

An RF inductor is used for matching applications and choke applications in the RF section which has wireless communication functions. By using three characteristic methods, you can select the optimum series for the intended application. For a smartphone or a module film type LQP series which is compact and also has high Q characteristics is optimum. For an RF inductor of size 1005 mm or more, the high Q wound type LQW series which has a large rated current value is recommended for use in a base station or STB. While the multilayer LQG series has a good balance between cost and performance, it is recommended for a wide range of automotive applications, based on our market achievements over many years. Products that are suitable for choke circuits using magnetic materials, such as the LQW_CN series, LQW_H series and other series are also available for power lines. You can select the optimum series from our lineup, based on either the intended application or the relationship between the size and Q characteristics.

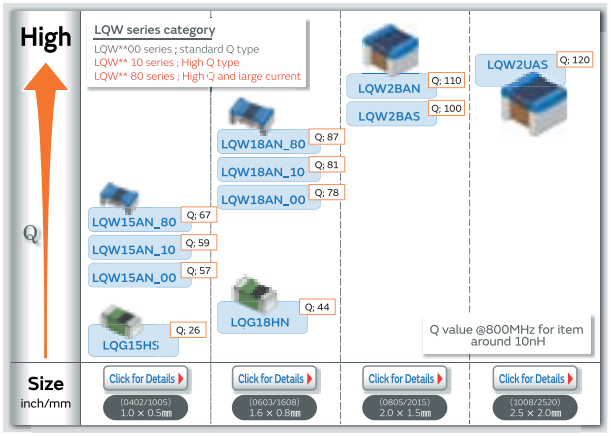
General (0.8×0.4 mm or less)

Lineup list



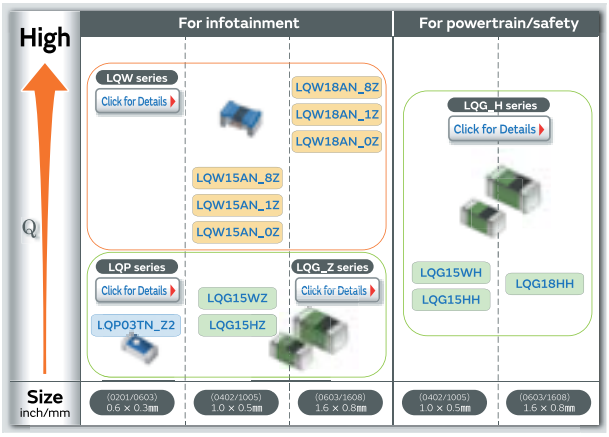
General (1.0×0.5 mm or more)

Lineup list



For Automotive

Lineup list



General Circuits Inductors

Main Type:

▪ Multilayer Type ▪ Wire-wound Type ▪ 2-in-1 Type

We have an extensive lineup of general purpose inductors for a variety of circuits.
You can select an inductor to match your particular application. Wire-wound type LQH_M, LQH_N series are suitable for large inductance, multilayer type LQM_M, LQM_N series are suitable for small size.
In addition, we have the 2-in-1 type HEAW series (part number: 1155EA-0001) and the small type HEAWS series (part number: 1211EA-1004) inductors for digital audio amplifiers.

Lineup

For Power Circuits (For General)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Metal Alloy Type	0603 (1608)	DFE18SAN		DFE18SAN_E0	0.8	240nH to 1μH	2A to 4.2A
				DFE18SAN_G0	1.0	240nH to 1μH	2.1A to 4.9A
Multilayer Type		LQM18PN		LQM18PN_B0	0.4	1.5μH	600mA
				LQM18PN_C0	0.55	470nH to 2.2μH	700mA to 850mA
				LQM18PN_D0	0.75	2.5μH	700mA
				LQM18PN_DH	0.75	2.2μH	650mA
				LQM18PN_F0	0.95	1μH	600mA
				LQM18PN_FH	0.95	470nH to 2.2μH	700mA to 1.4A
				LQM18PN_FR	0.95	220nH to 4.7μH	620mA to 1.25A
				LQM18PN_GH	1.0	1μH to 3.3μH	1.05A
				LQM18PW_CH	0.65	1μH to 2.5μH	750mA to 950mA
Wound Metal Aloy Type	0805 (2012)	DFE2012		DFE201208S	0.8	470nH to 2.2μH	1.8A to 4A
				DFE201210S	1.0	470nH to 2.2μH	2.1A to 4.8A
				DFE201210U	1.0	240nH to 2.2μH	2A to 6.5A
Multilayer Type		LQM21PN		LQM21PN_C0	0.55	470nH to 2.2μH	600mA to 1.1A
				LQM21PN_CA	0.65	2.2μH	1.05A
				LQM21PN_CH	0.55	470nH to 2.2μH	1.05A to 1.6A
				LQM21PN_EH	0.8	240nH to 2.2μH	1.1A to 2.8A
				LQM21PN_G0	1.0	470nH to 3.3μH	800mA to 1.3A
				LQM21PN_GC	1.0	1μH to 2.2μH	800mA to 900mA
				LQM21PN_GH	1.0	470nH to 4.7μH	1A to 2.4A
				LQM21PN_GR	1.0	1μH to 4.7μH	800mA to 1.3A
				LQM21PN_GS	1.0	2.2μH to 4.7μH	750mA to 950mA
Wound Metal Alloy Type	0806 (2016)	DFE2016		DFE201610C	1.0	560nH to 2.2μH	1.5A to 2.8A
				DFE201610E	1.0	240nH to 10μH	1A to 6.3A
				DFE201610P	1.0	240nH to 2.2μH	2A to 5.4A
				DFE201610R	1.0	470nH to 2.2μH	1.6A to 3A

Continued on the following page. ↗

Inductors (Coils)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Metal Alloy Type	0806 (2016)	DFE2016		DFE201612C	1.2	470nH to 2.2μH	1.6A to 3.4A
				DFE201612E	1.2	240nH to 4.7μH	1.8A to 6.6A
				DFE201612P	1.2	240nH to 2.2μH	2.1A to 6.5A
				DFE201612R	1.2	470nH to 2.2μH	1.7A to 3.5A
Wound Ferrite Core Type		LQH2MCN		LQH2MCN_02	0.95	1μH to 82μH	90mA to 485mA
				LQH2MCN_52	0.7	1μH to 22μH	130mA to 595mA
		LQH2MPN		LQH2MPN_GR	0.95	330nH to 82μH	210mA to 2.2A
Multilayer Type		LQM2MPN		LQM2MPN_DH	0.7	2.2μH	1.27A
				LQM2MPN_EH	0.8	240nH to 2.2μH	1.1A to 4.1A
				LQM2MPN_G0	1.0	470nH to 4.7μH	1.1A to 1.6A
				LQM2MPN_GH	1.0	160nH to 2.2μH	1.3A to 5A
Wound Metal Alloy Type	1008 (2520)	DFE2520		DFE252007F	0.7	470nH to 4.7μH	1.2A to 3.3A
				DFE252008C	0.8	470nH to 4.7μH	1.1A to 3A
				DFE252008U	0.8	470nH to 10μH	1A to 4.5A
				DFE252010C	1.0	470nH to 10μH	1A to 3.5A
				DFE252010F	1.0	330nH to 10μH	1.3A to 6.8A
				DFE252010P	1.0	330nH to 4.7μH	1.7A to 5.7A
				DFE252010R	1.0	1μH to 4.7μH	1.4A to 3A
				DFE252012C	1.2	470nH to 10μH	1A to 3.8A
				DFE252012F	1.2	330nH to 10μH	1.4A to 7.6A
				DFE252012P	1.2	330nH to 4.7μH	2A to 6.6A
				DFE252012R	1.2	1μH to 4.7μH	1.7A to 3.4A
Wound Ferrite Core Type		LQH2HPN		LQH2HPN_DR	0.6	470nH to 22μH	270mA to 1.67A
				LQH2HPN_GR	1.0	470nH to 100μH	210mA to 2.9A
				LQH2HPN_JR	1.2	470nH to 22μH	540mA to 3.5A
Multilayer Type		LQM2HPN		LQM2HPN_CH	0.55	240nH to 2.2μH	850mA to 2.55A
				LQM2HPN_E0	0.8	560nH	1.5A
				LQM2HPN_EH	0.8	240nH to 2.2μH	1.3A to 4.5A
				LQM2HPN_G0	1.0	470nH to 4.7μH	1.1A to 1.8A
				LQM2HPN_GC	1.0	1μH to 4.7μH	800mA to 1.5A
				LQM2HPN_GH	1.0	240nH to 2.2μH	1.5A to 5A
				LQM2HPN_GS	1.0	2.2μH to 4.7μH	1A to 1.1A
				LQM2HPN_J0	1.2	1μH to 3.3μH	1A to 1.5A
				LQM2HPN_JH	1.2	470nH to 2.2μH	1.5A to 3.2A
Wound Ferrite Core Type	3mm square	DEM28/DEM35		DEM2812C	1.2	470nH to 12μH	760mA to 3.1A
				DEM2815C	1.5	470nH to 15μH	800mA to 3.9A
				DEM2818C	1.8	470nH to 12μH	1A to 4.7A
				DEM3512C	1.2	680nH to 22μH	530mA to 2.5A
				DEM3518C	1.8	560nH to 22μH	880mA to 3.4A
		LQH3NPN		LQH3NPN_GR	1.0	470nH to 250μH	140mA to 2.82A
				LQH3NPN_JR	1.2	680nH to 47μH	570mA to 2.86A
				LQH3NPN_ME	1.5	1μH to 100μH	430mA to 3A
				LQH3NPN_MR	1.5	1μH to 47μH	460mA to 2.15A

Continued on the following page. ↗

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	1206 (3216)	LQM31PN		LQM31PN_00	0.95	470nH to 4.7μH	700mA to 1.4A
Wound Metal Alloy Type	1210 (3225)	DFE3225		DFE322510C	1.0	470nH to 10μH	1A to 3.8A
				DFE322512C	1.2	470nH to 10μH	1.2A to 4.7A
				DFE322512F	1.2	470nH to 10μH	1.7A to 6.7A
Wound Ferrite Core Type		LQH32P		LQH32PB_N0	1.7	470nH to 120μH	200mA to 3.4A
				LQH32PB_NC	1.7	470nH to 22μH	650mA to 4.4A
				LQH32PN_N0	1.7	470nH to 120μH	200mA to 3.4A
				LQH32PN_NC	1.7	470nH to 22μH	650mA to 4.4A
Multilayer Type		LQM32PN		LQM32PN_G0	1.0	1μH	1.8A
				LQM32PN_GC	1.0	1μH	2.2A
Wound Metal Alloy Type	4mm square	FDSD04		FDSD0412	1.2	330nH to 4.7μH	2.5A to 7.5A
				FDSD0415	1.5	220nH to 4.7μH	2.9A to 12A
				FDSD0420	2.0	330nH to 10μH	2.5A to 11A
				FDSD0420_D	2.0	330nH to 10μH	2.5A to 11A
				FDSD0420W	2.0	15μH to 22μH	2A to 2.5A
Wound Ferrite Core Type		LQH44PN		LQH44PN_GR	1.0	680nH to 47μH	410mA to 2.5A
				LQH44PN_J0	1.2	1μH to 47μH	380mA to 2A
				LQH44PN_P0	1.8	1μH to 22μH	800mA to 2.95A
		LQH43P		LQH43PB_26	2.8	1μH to 220μH	240mA to 3.4A
				LQH43PN_26	2.8	1μH to 220μH	240mA to 3.4A
		DEM4518		DEM4518C	1.8	1.2μH to 22μH	1A to 3.5A
				DEM4518C_DD	1.8	1.2μH to 22μH	1A to 3.5A
Wound Ferrite Core Type	5mm square	LQH5BP		LQH5BPB_T0	2.2	470nH to 22μH	1.4A to 7.7A
				LQH5BPN_38	4.0	1μH to 150μH	650mA to 7A
				LQH5BPN_T0	2.2	470nH to 22μH	1.4A to 7.7A
		D52LC/D53LC		D52LC	2.0	1.2μH to 100μH	260mA to 2.44A
				D53LC	3.0	1.1μH to 220μH	350mA to 3.87A
Wound Metal Alloy Type		FDSD05		FDSD0512	1.2	1μH to 6.8μH	2.3A to 6.1A
				FDSD0515	1.5	1μH to 4.7μH	3.2A to 7A
				FDSD0518	1.8	680nH to 10μH	2.7A to 9A
		FCUL05		FCUL0530	3.0	360nH to 470nH	16A to 18A
Wound Ferrite Core Type	6 to 9mm square	DG60		DG6028C	4.5	1μH to 22μH	1.7A to 5.8A
				DG6045C	4.5	1μH to 100μH	900mA to 9.5A
				DG6050C	5.0	1.2μH to 100μH	1.2A to 9.8A
		D63		D63LCB	3.0	1μH to 150μH	440mA to 4.52A
		DS75LC		DS75LC	5.0	1μH to 470μH	430mA to 9.2A
		DEM80		DEM8030C	3.0	1.5μH to 47μH	1.3A to 7.5A
				DEM8040C	4.0	1.5μH to 33μH	2.4A to 10A
				DEM8045C	4.5	1.5μH to 47μH	2.1A to 11.2A
				DEM8045C_DD	4.5	1.5μH to 47μH	2.1A to 11.2A
		DG80		DG8040C	4.0	1μH to 100μH	1.3A to 10.4A

Continued on the following page. ↗

Inductors (Coils)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Metal Alloy Type	6 to 9mm square	FDSD06		FDSD0630	3.0	680nH to 10µH	5.4A to 17A
		FCUL06		FCUL0624	2.4	220nH to 470nH	17A to 24A
				FCUL0630	3.0	120nH to 680nH	15A to 32A
		FDV05/FDV06		FDV0530	3.0	110nH to 4.7µH	3.6A to 19.6A
				FDV0618	1.8	240nH to 3.3µH	4.1A to 14A
				FDV0620	2.0	200nH to 4.7µH	3.5A to 16.2A
				FDVE0630	3.0	160nH to 10µH	3.1A to 20.7A
		FDUE06		FDUE0640	4.0	150nH to 420nH	22A to 33A
				FDUE0650	5.0	600nH to 1µH	16A to 18A
Wound Ferrite Core Type	10mm square and over	DEM10050		DEM10050C	5.0	1.5µH to 33µH	3.5A to 15.3A
				DEM10050C_DD	5.0	1.5µH to 33µH	3.5A to 15.3A
		DS10/DS12		DS104C2	4.8	1.1µH to 120µH	970mA to 11.7A
				DS106C2	6.8	1.2µH to 330µH	690mA to 12A
				DS126C2	6.8	1.7µH to 680µH	580mA to 11.8A
Wound Metal Alloy Type		FDA10/FDA12		FDA1055	5.5	560nH to 5.6µH	8A to 27.7A
				FDA1254	5.4	680nH to 8µH	9.1A to 29.1A
		FDUE10		FDUE1040D	4.0	220nH to 1µH	18A to 32A
		FDVE10		FDVE1040	4.0	1.5µH to 10µH	6.1A to 14.6A
		FCUL10		FCUL1040	4.0	180nH to 420nH	34A to 53A
				FCUL1060	6.0	360nH to 560nH	34A to 41A
		FDUE12		FDUE1245	4.5	500nH to 2.2µH	17A to 30A
				FDUE1260	6.0	450nH	34A

For Choke Circuits (For General)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	0402 (1005)	LQW15D		LQW15DN_00	0.7	10µH to 15µH	100mA to 120mA
Multilayer Type	0603 (1608)	LQM18FN		LQM18FN_00	0.9	1µH to 10µH	50mA to 150mA
	0805 (2012)	LQM21DN		LQM21DN_00	1.05	1µH to 47µH	7mA to 60mA
		LQM21FN		LQM21FN_00	1.45	1µH to 47µH	7mA to 220mA
				LQM21FN_70	1.45	4.7µH to 10µH	100mA to 120mA
				LQM21FN_80	1.45	4.7µH to 10µH	100mA to 120mA
Wound Ferrite Core Type	1206 (3216)	LQH31CN		LQH31CN_03	2.0	120nH to 100µH	80mA to 970mA
	1210 (3225)	LQH32CN		LQH32CN_23	2.2	1µH to 560µH	60mA to 800mA
				LQH32CN_33	2.2	150nH to 10µH	450mA to 1.45A
				LQH32CN_53	1.7	1µH to 100µH	100mA to 1A
		LQH32DN		LQH32DN_23	2.2	1µH to 560µH	60mA to 800mA
				LQH32DN_53	1.7	1µH to 100µH	100mA to 1A
	4mm square	LQH43CN		LQH43CN_03	2.8	1µH to 470µH	90mA to 1.08A
				LQH43CN_33	2.8	560nH to 3.9µH	1.6A to 2.95A
	5mm square	LQH55DN		LQH55DN_03	5.0	120nH to 10mH	50mA to 6A
	6 to 9mm square	LQH66SN		LQH66SN_03	5.0	270nH to 10mH	50mA to 6A

For Power Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0603 (1608)	LQM18PZ		LQM18PZ_CH	0.6	1μH to 2.5μH	750mA to 950mA
				LQM18PZ_DH	0.75	2.2μH	650mA
				LQM18PZ_FH	0.95	2.2μH	700mA
	0805 (2012)	LQM21PZ		LQM21PZ_C0	0.55	470nH to 2.2μH	600mA to 1.1A
				LQM21PZ_G0	1.0	470nH to 3.3μH	800mA to 1.3A
				LQM21PZ_GC	1.0	1μH to 2.2μH	800mA to 900mA
				LQM21PZ_GR	1.0	1μH to 4.7μH	800mA to 1.3A
Wound Ferrite Core Type	0806 (2016)	LQH2MPZ		LQH2MPZ_GR	0.95	330nH to 82μH	210mA to 2.2A
Multilayer Type		LQM2MPZ		LQM2MPZ_G0	1.0	470nH to 4.7μH	1.1A to 1.6A
				LQM2MPZ_JH	1.2	100nH	4A
Wound Ferrite Core Type	1008 (2520)	LQH2HPZ		LQH2HPZ_DR	0.6	470nH to 22μH	270mA to 1.67A
				LQH2HPZ_GR	1.0	470nH to 22μH	460mA to 2.9A
				LQH2HPZ_JR	1.2	470nH to 22μH	540mA to 3.5A
Multilayer Type		LQM2HPZ		LQM2HPZ_E0	0.8	560nH	1.5A
				LQM2HPZ_G0	1.0	470nH to 4.7μH	1.1A to 1.8A
				LQM2HPZ_GC	1.0	1μH to 4.7μH	800mA to 1.5A
				LQM2HPZ_GS	1.0	2.2μH to 4.7μH	1A to 1.1A
				LQM2HPZ_J0	1.2	1μH to 3.3μH	1A to 1.5A
Wound Metal Alloy Type		DFE2520		DFE252012P_D	1.2	330nH to 4.7μH	1.9A to 6A
Wound Ferrite Core Type	3mm square	LQH3NPZ		LQH3NPZ_GR	1.0	470nH to 47μH	460mA to 2.82A
				LQH3NPZ_JR	1.2	680nH to 47μH	570mA to 2.86A
				LQH3NPZ_ME	1.5	1μH to 100μH	430mA to 3A
	1210 (3225)	LQH32PZ		LQH32PZ_N0	1.7	470nH to 120μH	200mA to 3.4A
				LQH32PZ_NC	1.7	470nH to 22μH	650mA to 4.4A
	4mm square	LQH44PZ		LQH44PZ_GR	1.0	680nH to 47μH	410mA to 2.5A
		LQH43PZ		LQH43PZ_26	2.8	1μH to 220μH	240mA to 3.4A
	5mm square	LQH5BPZ		LQH5BPZ_T0	2.2	470nH to 22μH	1.4A to 7.7A

For Power Circuits (Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0805 (2012)	LQM21PH		LQM21PH_GC	1.0	2.2μH	800mA
Wound Ferrite Core Type	1210 (3225)	LQH32PH		LQH32PH_N0	1.7	470nH to 10μH	750mA to 3.4A
				LQH32PH_NC	1.7	470nH to 22μH	650mA to 4.4A
	4mm square	LQH43PH		LQH43PH_26	2.8	1μH to 220μH	240mA to 3.4A
	6 to 9mm square	MDH60/ MDH70		MDH6045C	4.8	1μH to 470μH	340mA to 5.8A
				MDH7045C	4.8	1μH to 470μH	360mA to 8.8A
		MBH60/ MBH70		MBH6045C	4.8	1μH to 470μH	410mA to 6.3A
				MBH7045C	4.8	3.3μH to 1mH	310mA to 3.5A
Wound Metal Alloy Type		DFEG70/ DFEH70		DFEG7030D	3.0	1μH to 22μH	2A to 9.1A
				DFEH7030D	3.0	1μH to 22μH	2A to 9.1A

Continued on the following page. ↗

Inductors (Coils)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	10mm square and over	MDH10/ MDH12		MDH10060C	6.3	4.7µH to 470µH	560mA to 5.9A
				MDH12577C	8.0	4.7µH to 470µH	1A to 11A
		MBH10/ MBH12		MBH10145C	4.8	3.3µH to 1.5mH	330mA to 4.9A
				MBH12282C	8.5	2µH to 1mH	590mA to 13A
				MBH12575C	6.8	2.7µH to 220µH	1.2A to 10A
Wound Metal Alloy Type		DFEG10/ DFEH10		DFEG10040D	4.0	1µH to 47µH	2.9A to 18A
				DFEH10040D	4.0	1µH to 47µH	2.9A to 18A
		DFEG12/ DFEH12		DFEG12060D	6.0	1µH to 47µH	3.6A to 20A
				DFEH12060D	6.0	1µH to 47µH	3.6A to 20A

For Choke Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	1210 (3225)	LQH32D		LQH32DZ_23	2.2	1µH to 470µH	60mA to 800mA
				LQH32DZ_53	1.7	1µH to 100µH	100mA to 1A

For Choke Circuits (Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	1210 (3225)	LQH32C		LQH32CH_23	2.2	1µH to 22µH	250mA to 800mA
				LQH32CH_33	2.2	150nH to 10µH	450mA to 1.45A
				LQH32CH_53	1.7	1µH to 22µH	250mA to 1A

RF Circuits (0.8 x 0.4 mm or less)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Non-magnetic Type	0201 (0603)	LQW03A		LQW03AW_00	0.45	1nH to 15.5nH	230mA to 900mA
	03019 (0805)	LQW04A		LQW04AN_00	0.45	0.8nH to 33nH	140mA to 1.8A
				LQW04AN_10	0.45	36nH to 56nH	180mA to 200mA
Film Type	008004 (0201)	LQP01		LQP01HQ		0.3nH to 2.7nH	200mA to 500mA
	01005 (0402)	LQP02		LQP02HQ_02	0.32	0.2nH to 56nH	100mA to 1A
				LQP02TQ_02	0.22	0.2nH to 22nH	120mA to 990mA
				LQP02TN_02	0.22	0.2nH to 39nH	90mA to 320mA
	0201(0603)	LQP03		LQP03HQ_02	0.42	0.6nH to 150nH	80mA to 1.1A
				LQP03TQ_02	0.32	0.6nH to 13nH	250mA to 1A
				LQP03TN_02	0.33	0.6nH to 270nH	60mA to 850mA
				LQP03TG_02	0.33	0.1nH to 120nH	80mA to 850mA
				LQP03PN_02	0.33	2.2nH to 4.7nH	900mA to 1.4A

RF Circuits (1.0 x 0.5 mm or more)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Non-magnetic Type	0402 (1005)	LQW15A		LQW15AN_00	0.6	1.5nH to 120nH	110mA to 1A
				LQW15AN_10	0.6	1.3nH to 8.4nH	640mA to 1.2A

Continued on the following page. ↗

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Non-magnetic Type	0402 (1005)	LQW15A		LQW15AN_80	0.6	1.3nH to 75nH	320mA to 3.15A
				LQW15AW_80	0.66	51nH to 220nH	220mA to 480mA
	0603 (1608)	LQW18A		LQW18AN_00	1.0	2.2nH to 470nH	75mA to 850mA
				LQW18AN_10	1.0	2.2nH to 33nH	550mA to 1.4A
				LQW18AN_80	1.0	2.2nH to 390nH	190mA to 3.2A
				LQW18AS_00	1.0	1.6nH to 390nH	100mA to 700mA
				LQW18AS_0C	1.0	4.3nH to 390nH	100mA to 700mA
	0806 (2016)	LQW2B		LQW2BAN_00	1.52	3.2nH to 200nH	750mA to 3.8A
				LQW2BAS_00	1.52	2.8nH to 820nH	180mA to 800mA
				LQW2BHN_03	1.78	3.3nH to 470nH	160mA to 1.32A
				LQW2BHN_13	1.78	2.7nH to 27nH	900mA to 1.9A
	1008 (2520)	LQW2U		LQW2UAS_00	2.03	12nH to 4.7µH	260mA to 1A
	1206 (3216)	LQW31H		LQW31HN_03	2.0	8.8nH to 100nH	230mA to 750mA
Film Type	0402 (1005)	LQP15M		LQP15MN_02	0.45	1nH to 33nH	60mA to 400mA
	0603 (1608)	LQP18M		LQP18MN_02	0.6	1.3nH to 100nH	50mA to 300mA
Multilayer Type	0402 (1005)	LQG15H		LQG15HN_02	0.55	1nH to 120nH	150mA to 1A
				LQG15HS_02	0.55	1nH to 270nH	110mA to 1A
	0603 (1608)	LQG18H		LQG18HN_00	0.95	1.2nH to 100nH	350mA to 1.1A

For Choke/Tuner Circuits (1.0 x 0.5 mm or more)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	0402 (1005)	LQW15C		LQW15CN_00	0.6	18nH to 200nH	390mA to 1.4A
				LQW15CN_10	0.6	20nH to 3.3µH	130mA to 2.2A
	0402 (1005)	LQW15D		LQW15DN_00	0.7	10µH to 15µH	100mA to 120mA
	0603 (1608)	LQW18C		LQW18CN_00	0.95	4.9nH to 650nH	430mA to 2.6A
	0805 (2012)	LQW21H		LQW21HN_00	1.0	470nH to 2.2µH	75mA to 160mA
	1206 (3216)	LQH31H		LQH31HN_03	2.0	54nH to 880nH	180mA to 920mA

For RF Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Non-magnetic Type	0402 (1005)	LQW15A		LQW15AN_0Z	0.6	1.5nH to 120nH	110mA to 1A
				LQW15AN_1Z	0.6	1.3nH to 8.4nH	640mA to 1.2A
				LQW15AN_8Z	0.6	1.3nH to 75nH	320mA to 3.15A
	0603 (1608)	LQW18A		LQW18AN_0Z	1.0	2.2nH to 470nH	75mA to 850mA
				LQW18AN_1Z	1.0	2.2nH to 33nH	550mA to 1.4A
				LQW18AN_8Z	1.0	2.2nH to 390nH	190mA to 3.2A
				LQW18AS_0Z	1.0	1.6nH to 390nH	100mA to 700mA
Film Type	0201 (0603)	LQP03T		LQP03TN_Z2	0.33	0.6nH to 120nH	80mA to 850mA
Multilayer Type	0402 (1005)	LQG15H		LQG15HZ_02	0.55	1nH to 270nH	110mA to 1A
		LQG15W		LQG15WZ_02	0.6	0.7nH to 150nH	110mA to 1.2A

For RF Circuits (Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0402 (1005)	LQG15H		LQG15HH_02	0.55	1nH to 270nH	110mA to 1A
		LQG15W		LQG15WH_02	0.6	0.7nH to 150nH	110mA to 1.2A
	0603 (1608)	LQG18H		LQG18HH_00	0.95	1.2nH to 270nH	200mA to 1.1A

For Choke/Tuner Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	0402 (1005)	LQW15C		LQW15CN_0Z	0.6	18nH to 200nH	390mA to 1.4A
				LQW15CN_1Z	0.6	20nH to 560nH	300mA to 2.2A
	0603 (1608)	LQW18C		LQW18CN_0Z	0.95	4.9nH to 650nH	430mA to 2.6A
	1206 (3216)	LQH31H		LQH31HZ_03	2.0	54nH to 880nH	180mA to 920mA

General Purpose (For General)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	03019 (0805)	LQW04CA		LQW04CA_00	0.55	60nH to 510nH	200mA to 620mA
	0402 (1005)	LQW15CA		LQW15CA_00	0.66	22nH to 2μH	130mA to 1.3A
	0603 (1608)	LQW18CA		LQW18CA_00	0.95	32nH to 580nH	450mA to 2.2A
	1008 (2520)	LLB/M		LLB2520	1.7	1μH to 47μH	100mA to 480mA
				LLM2520	1.7	100nH to 220μH	44mA to 570mA
	1206 (3216)	LQH31MN		LQH31MN_03	2	150nH to 100μH	45mA to 250mA
	1210 (3225)	LLM		LLM3225	2.4	100nH to 1mH	19mA to 600mA
		LQH32MN		LQH32MN_23	2.2	1μH to 560μH	40mA to 445mA
	4mm square	LQH44NN		LQH44NN_03	4.5	510nH to 470μH	145mA to 4.5A
		LQH43M/N		LQH43MN_03	2.8	1μH to 1.5mH	40mA to 500mA
				LQH43NN_03	2.8	1μH to 2.4mH	25mA to 500mA
Multilayer Type	0402 (1005)	LQB15NN		LQB15NN_10	0.55	220nH to 560nH	300mA to 380mA
	0603 (1608)	LQB18NN		LQB18NN_10	0.95	220nH to 560nH	300mA to 450mA
		LQM18JN		LQM18JN_00	0.65	100nH to 160nH	550mA to 650mA
		LQM18NN		LQM18NN_00	0.95	47nH to 2.2μH	15mA to 50mA
	0805(2012)	LQM21NN		LQM21NN_10	1.05	100nH to 4.7μH	30mA to 250mA

General Purpose (For Automotive Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	1210 (3225)	LQH32NZ		LQH32NZ_23	2.2	1μH to 470μH	45mA to 445mA
	4mm square	LQH43NZ		LQH43NZ_03	2.8	1μH to 2.2mH	30mA to 500mA
2-in-1 Type	10mm square and over	HEAWS		HEAWS	10.0	10μH	5A
		HEAW		HEAW	10.5	10μH	7.2A

General Purpose (For Automotive Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core Type	1210 (3225)	LQH32NH		LQH32NH_23	2.2	1μH to 560μH	40mA to 780mA

Variable Inductors

Variable inductor products are coil products that allow the inductance to be easily varied by changing the position of the ferrite core in a threaded structure.
The interior is covered by a metal case that is magnetically shielded, while a resin molded structure protects the windings with a high degree of reliability.

Product Lineup

5CCEG

6.5×5.9×6.0(H) mm MAX.

Supported inductance range: 0.05 to 2.7μH
Features
- High reliability that conforms to automotive standards

Applications
- Ideal for use as RF matching transformers for car tuners
- Operating temperature range: -40°C to +85°C

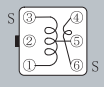
FSDVA

5.8×5.8×5.5(H) mm MAX.

Supported inductance range:
0.1 to 52mH(1 to 7 mH for corner sensor applications)
Features
- Resistant to mechanical stress
- Operating temperature range:
  Up to 20 mH (-40°C to +105°C)
  20 mH or more (-40°C to +85°C)
- Various reliability conditions guaranteed for 1,000 hours (evaluation performed up to 3,000 hours)
- Lead coplanarity guaranteed within 0.1 mm

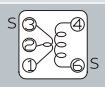
Specifications

Surface Mount Variable Coil
5CCEG Series

Winding Connection (Bottom View)	Part Number	Test Frequency (MHz)	Resonance Capacitor Range (pF)	Unloaded Q
	#A1313AN-0001GGH=P3	100	11.4+3/-3%	72+/-20%
	#A1313AN-0002GRG=P3	100	11.4+5/-2%	61+/-20%
	#A1313AN-0003GRG=P3	100	11.4+2/-4%	54+/-20%
	#A1313AN-0004GGH=P3	100	11.7+3/-3%	72+/-20%

Inductors (Coils)

FSDVA Series

Winding Connection (Bottom View)	Part Number	Test Frequency (kHz)	Inductance Range (mH)	Unloaded Q
	**N1342BCA-0004UG=P3**	252	4.4±3%	25 min.
	**N1342DEA-0008BQE=P3**	252	2.5±5%	25 min.

Winding Connection (Bottom View)	Part Number	Test Frequency (kHz)	Inductance Tolerance (mH)	Unloaded Q
	**N1342AAA-0001Z=P3**	79.6	52±7%	10 min.

Effective Use of Power Inductors
The product group of Murata's inductors for power circuits consists of the wire wound type and the monolithic type. For the applications of power inductors, Murata has prepared the "Murata Power Inductor Selection Tool," which can calculate and display the performance of inductors based on actual use conditions.
The type of application where single or multiple power inductors are used can have an effect on the efficiency of the part(s). Core losses are suffered depending on the Temperature, Frequency, and Current needed for the application. Using the "Murata Power Inductor Selection Tool," you can input the needed Temperature, Frequency, and Current for the application and easily select a usable part.

URL: https://www.murata.com/products/inductor/chip/learn/apply/power

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

- Chip Inductors (Chip Coils) Cat. No. 005E
- EMI Suppression Filters (for DC)/Chip Inductors for Automotive Cat. No. C51E

Resistors

Full lineup for various applications

Summary

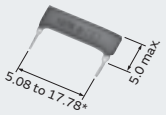
Using Murata's ceramic processing technology and unique materials, we offer a series of resistor products.

Lineup

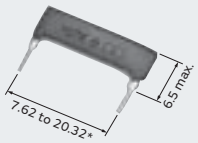
●High Voltage Resistors

High Voltage Resistors

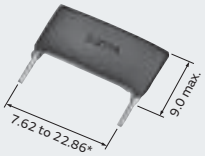
Featuring thick-film resistors, the Murata MHR series of high-voltage resistors is available in compact and thin SIP packages. Variants with small deviations are also available on request.



MHR03 Series



MHR04 Series



MHR06 Series

(in mm)

*The terminal pitch is an integral multiple of 2.54mm.

Series	Resistance (min.) (MΩ)	Resistance (max.) (MΩ)	Maximum Operating Voltage (Single Use) (kV)	Maximum Operating Voltage (Molded Use) (kV)	Rated Power (W)
MHR03	1	500 to 1000	2 to 8	3 to 14	0.3 to 1.0
MHR04	1	1000	3.5 to 9	10 to 16	0.6 to 1.3
MHR06	1	1000	3.5 to 10	10 to 20	0.8 to 1.6

Resistance 2 element type is also available.
For resistance value and ratio, please contact us.

Timing Devices

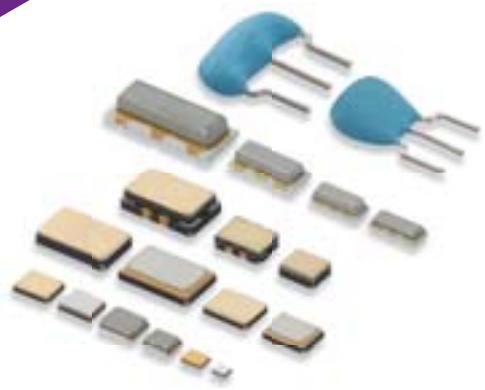
A stable timing source for microprocessors in various electronic devices

Summary

Murata's ceramic processing technology and unique piezoelectric material has led to the development of a range of small and thin ceramic timing devices that offer high oscillation frequency and remarkable oscillation tolerance.

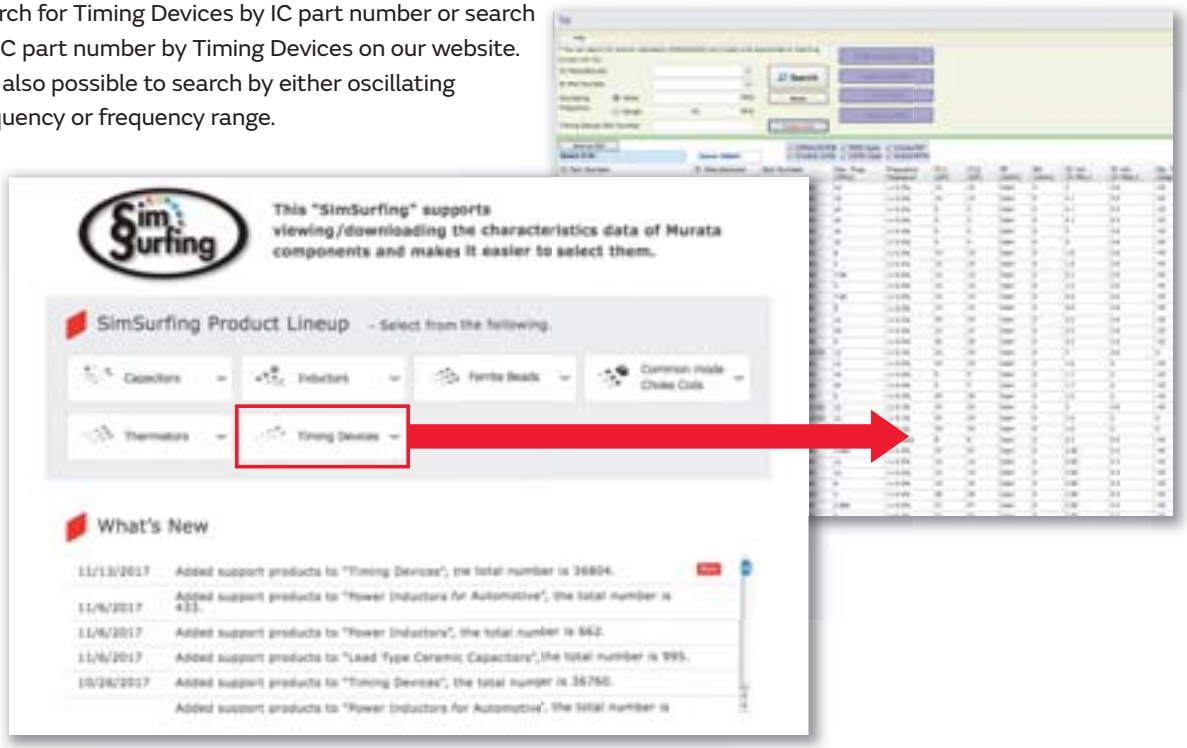
Lineup

●Crystal Units ●Crystal Oscillators
●Ceramic Resonators CERALOCK®



IC Part Number - Timing Devices Search

Search for Timing Devices by IC part number or search for IC part number by Timing Devices on our website. It is also possible to search by either oscillating frequency or frequency range.



https://www.murata.com/simsurfing/

Detailed Catalogs

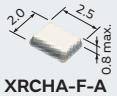
For more details, please refer to our printed catalogs and the PDF catalogs on our website.

▪ Ceramic Resonators (CERALOCK®)	Cat. No. P16E
▪ Ceramic Resonator (CERALOCK®) Application Manual	Cat. No. P17E
▪ Crystal Units/Crystal Oscillators	Cat. No. P79E

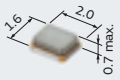
Crystal Units

Crystals Unit utilize highly accurate frequency-based high-grade quartz crystal elements.
We offer a wide lineup of Crystal Units using Murata's proven package technology for small digital devices, automotive, etc.

For Automotive



XRCHA-F-A

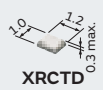


XRCGB-F-A

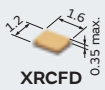
(in mm)

Series	Type	Seal	Frequency (MHz)	Frequency Tolerance (ppm)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
XRCHA-F-A	HCR2520	Resin	16.0000 – 24.0000	±100	±100	-40 to 125
XRCGB-F-A	HCR2016	Resin	24.0000 – 29.9999	±30	±35	-40 to 125
			30.0000 – 48.0000	±50	±65	-40 to 125

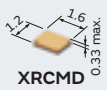
For Consumer/Industrial



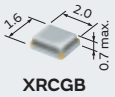
XRCTD



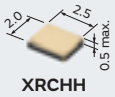
XRCFD



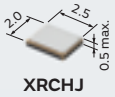
XRCMD



XRCGB



XRCHH

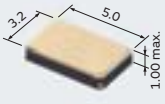


XRCHJ

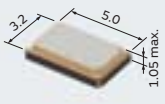
XRCHA

XRCJH

XRCJK



XRCLH



XRCLK

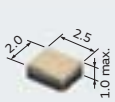
(in mm)

Series	Type	Seal	Frequency (MHz)	Frequency Tolerance (ppm)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
XRCTD	MCR1210	Metal	32.0000 – 52.0000	±10	±10	-30 to 85
XRCFD	MCR1612	Metal	24.0000 – 29.9999	±10	±10	-20 to 70
XRCMD	MCR1612	Metal	30.0000 – 48.0000	±10	±10	-20 to 70
XRCGB-F-H	HCR2016	Resin	24.0000 – 25.0000	±10	±10	-20 to 70
			26.0000 – 32.0000	±10	±10	-30 to 85
XRCGB-F-P	HCR2016	Resin	16.0000 – 38.4000	±20	±20	-30 to 85
XRCGB-F-M	HCR2016	Resin	16.0000 – 32.0000	±30	±40	-30 to 85
			33.8688 – 50.0000	±45	±40	-30 to 85
XRCGB-F-L	HCR2016	Resin	16.0000 – 50.0000	±100	±50	-30 to 85
XRCGB-F-Z	HCR2016	Resin	16.0000 – 50.0000	±100	±100	-40 to 105
XRCHH	TAS-2520F	Metal	16.0000 – 52.0000	±10	±15	-30 to 85
XRCHJ	TDS-2520F	Seam	16.0000 – 52.0000	±10	±15	-30 to 85
XRCHA-F-L	HCR2520	Resin	16.0000 – 20.0000	±100	±100	-30 to 85
XRCHA-F-Z	HCR2520	Resin	16.0000 – 20.0000	±100	±100	-40 to 105
XRCJH	TAS-3225J	Metal	13.0000 – 52.0000	±10	±15	-30 to 85
XRCJK	TSS-3225J	Seam	12.0000 – 52.0000	±10	±15	-30 to 85
XRCLH	TAS-5032F	Metal	10.0000 – 52.0000	±10	±15	-30 to 85
XRCLK	TSS-5032A	Seam	10.0000 – 52.0000	±10	±15	-30 to 85

Crystal Oscillators

We offer a varied lineup of Crystal Oscillators using highly reliable crystal units, circuit engineering, superior temperature compensation methods, and measurement furthered by our long experience and expertise.

For Consumer/Industrial

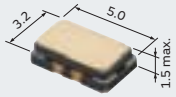


XNCHH

XNCJH

XTCHH

XTCJH



XTCLH_J

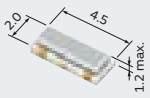
(in mm)

Series	Type	VC Function	Frequency (MHz)	Initial Frequency Tolerance (ppm)	Frequency Shift by Temperature (ppm max.)	Frequency Aging (ppm max./year)	Operating Temperature Range (°C)
XNCHH	TTS27NSC-A7	-	10.0000 – 52.0000	±1.0	±0.50	±1.0	-30 to 85
XNCJH	TTS18NSH-A7	-	10.0000 – 52.0000	±1.0	±0.50	±1.0	-30 to 85
XTCHH	TTS27VSC-A7	●	10.0000 – 52.0000	±1.0	±0.50	±1.0	-30 to 85
XTCJH	TTS18VSH-A7	●	10.0000 – 52.0000	±1.0	±0.50	±1.0	-30 to 85
XTCLH_J	TTS14VSH	●	10.0000 – 40.0000	±0.5	±0.28	±0.5	-40 to 85

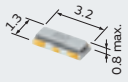
Ceramic Resonators CERALOCK®

Wide product lineup for automotive and consumer applications with SMD and leaded packages.

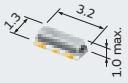
MHz Chip Type for Automotive (Tight Frequency Tolerance)



CSTCR_G15C



CSTCE_G15C



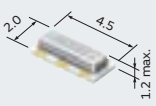
CSTCE_V13C

(in mm)

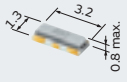
Series	Frequency (MHz)	Frequency Tolerance (%)	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCR_G15C	4.00 – 7.99	±0.1	±0.13	-40 to 125
CSTCE_G15C	8.00 – 13.99	±0.1	±0.13	-40 to 125
CSTCE_V13C	14.00 – 20.00	±0.1	±0.13	-40 to 125

MHz Chip Type for Automotive (Standard Frequency Tolerance)

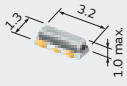
CSTCC_G_A



CSTCR_G_B



CSTCE_G_A

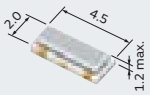


CSTCE_V_C

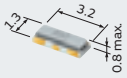
(in mm)

Series	Frequency (MHz)	Frequency Tolerance (%)	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCC_G_A	2.00 – 3.99	±0.5	±0.40 (15pF) -0.60/+0.30 (47pF)	-40 to 125
CSTCR_G_B	4.00 – 7.99	±0.5	±0.15	-40 to 125
CSTCE_G_A	8.00 – 13.99	±0.5	±0.20	-40 to 125
CSTCE_V_C	14.00 – 20.00	±0.5	±0.15	-40 to 125

MHz Chip Type for Consumer Electronics (Tight Frequency Tolerance)



CSTCR_G15L



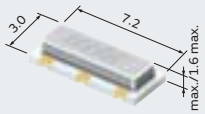
CSTCE_G15L

CSTCE_V13L

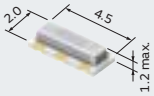
(in mm)

Series	Frequency (MHz) 0 10 20 30 40 50 60 70	Frequency Tolerance (%) 0 1	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCR_G15L	4.00 – 7.99	±0.1	±0.08	0 to 70
CSTCE_G15L	8.00 – 13.99	±0.1	±0.08	0 to 70
CSTCE_V13L	14.00 – 20.00	±0.1	±0.08	0 to 70

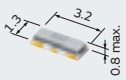
MHz Chip Type for Consumer Electronics (Standard Frequency Tolerance)



CSTCC_G



CSTCR_G



CSTCE_G

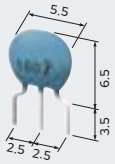
CSTCE_V

(in mm)

Series	Frequency (MHz) 0 10 20 30 40 50 60 70	Frequency Tolerance (%) 0 1	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCC_G	2.00 – 3.99	±0.5	±0.30 (15pF) ±0.40 (47pF)	-20 to 80
CSTCR_G	4.00 – 7.99	±0.5	±0.20	-20 to 80
CSTCE_G	8.00 – 13.99	±0.5	±0.20	-20 to 80
CSTCE_V	14.00 – 20.00	±0.5	±0.30	-20 to 80

MHz Lead Type for Consumer Electronics (Standard Frequency Tolerance)

CSTLS_G



CSTLS_X

(in mm)

Series	Frequency (MHz) 0 10 20 30 40 50 60 70	Frequency Tolerance (%) 0 1	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTLS_G	3.40 – 10.00	±0.5	±0.20 (15pF) -0.40/+0.20 (47pF)	-20 to 80
CSTLS_X	16.00 – 70.00	±0.5	±0.20	-20 to 80

Filters

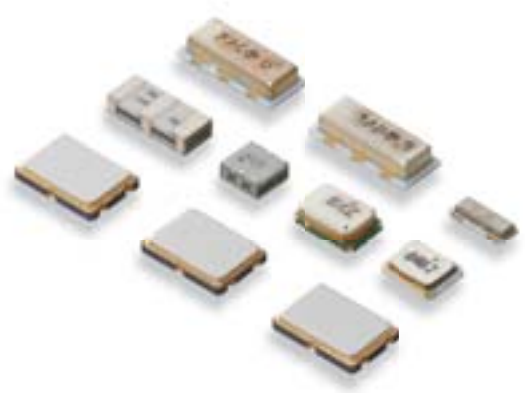
Broad lineup of Filters for video, audio, RF/Local, Duplexers, and Filters for IF

Summary

Using Murata's ceramic proccessing technology and unique materials, we offer miniaturized filters with excellent properties for advanced digital audio/visual systems and communication equipment.

Lineup

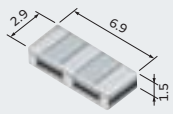
●Ceramic Filters CERAFIL® (Filters, Traps, and Discriminators)
●Crystal Filters ●SAW Filters for Mobile Communications
●Dielectric Filters GIGAFIL® ●Chip Multilayer LC Filters



Ceramic Filters CERAFIL®

CERAFIL® 10.7MHz Chip Type

Small and lightweight filters for IF in communications or AV equipment using unique piezoelectric material.



SFECK / SFECV Series

(in mm)

Type	Series	3dB Bandwidth (kHz)		
		E	J	K
		330	150	110
High-reliability Type	SFECK10M7☐	–	●	●
Standard Type	SFECV10M7☐	–	●	●
Standard Type	SFECV15M0☐	●	–	–

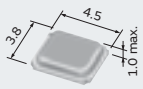
☐ is filled with the letter designating the required 3dB bandwidth.

SFECF Series

(in mm)

Type	Series	3dB Bandwidth (kHz)				
		D	E	F	G	H
		350	330	280	230	180
Standard Type	SFECF10M7☐	●	●	●	●	●

☐ is filled with the letter designating the required 3dB bandwidth.



SFSCE Series

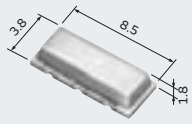
(in mm)

Type	Series	3dB Bandwidth (kHz) min.		
		03	04	05
		±500	±400	±325
Wide Bandwidth	SFSCE10M7WF☐☐	●	●	●

☐ is filled with the letter designating the required 3dB bandwidth.

CERAFIL® 2.3 to 6.5MHz Chip Type

The SFSKA Series has distinctive features such as wide bandwidth and stable filter performance, enabling customers to design smaller products.
The SFSKB Series is suitable for low frequency range.



SFSKA Series

SFSKB Series

(in mm)

Series	Center Frequency (MHz)												3dB Bandwidth (kHz)
	2.3	2.8	3.2	3.8	4.3	4.5	4.8	5.2	5.5	5.7	6.0	6.5	
SFSKA	–	–	–	–	–	●	–	–	●	–	●	●	±60 min.
SFSKB	●	●	●	●	●	–	●	●	–	●	–	–	±75 min.

Ceramic Traps

The TPSKA Series has distinctive features such as high attenuation and high performance group delay time, enabling customers to design smaller products.

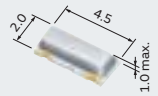
TPSKA Series

(in mm)

Series	Center Frequency (MHz)	Attenuation (dB)
TPSKA	4.500/5.500/6.000/6.500	35 min.

Ceramic Discriminators

In combination with ICs, this type obtains stable demodulation characteristics in a wide bandwidth.



CDSCB Series

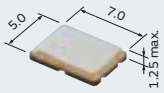
(in mm)

Series	Center Frequency
CDSCB	10.700MHz±30kHz

The recommended part number depends on IC specifications. Please contact us with the IC part number to be applied.

Crystal Filters

Our original wafer-thin technology has made it possible to make highly reliable filters in various applications such as radio communication worldwide.



(in mm)

XDCAF / XDCAG / XDCAH Series

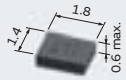
Series	Type	Frequency Range (MHz)	Number of Poles
XDCAF	TM7050F	20 to 80 [Fundamental] 70 to 150 [3rd overtone]	2
XDCAG	TM7050G		4
XDCAH	TM7050H		4

*Please be sure to consult with our sales representative or engineer if you require other center frequency.

SAW Filters for Mobile Communications

SAW Duplexers

Low loss, high attenuation performance, small size, highly selective pass band, chip size package



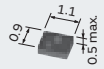
(in mm)

SAYEY Series

RF Filters

Low loss, high attenuation performance, small size, highly selective pass band, chip size package

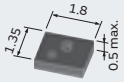
Single Filter



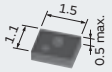
(in mm)

SAFFB Series

Dual Filter



SAWEN Series



SAWFD Series

(in mm)

SAW Filters and SAW Duplexers may be used only in the following equipment:
Mobile phones, cordless telephones (except automobile telephone), smartphones, tablet PC, PC (including laptop/netPC), game machines, cameras (except for business use and for security), STB, electronic dictionaries, and digital audio instruments.
Please contact us for other usages.

Dielectric Filters GIGAFIL®

This is a high frequency dielectric filter for Wi-Fi routers, accespoints, communication infrastructures of mobile phone base stations, for example.
It employs a unique plate construction which enables the filter to be compact and have a low profile.

TDF Series

	Series	Frequency Range (MHz) 100 1000 2000 3000 4000 5000 6000 7000	Number of Resonators	Input Power Range
RF/IF/Local Filter	TDF	2000 — 6000	2 to 5	1 to 10W*

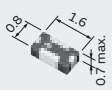
*Power depends upon specifications.

Chip Multilayer LC Filters

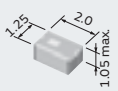
Ultra-small and low-profile filters based on ceramic multilayer technology.

Band Pass Filters

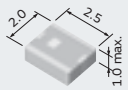
LFB15 Series



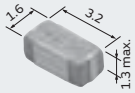
LFB18 Series



LFB21 Series



LFB2H Series

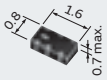


LFB31 Series

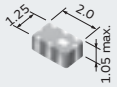
(in mm)

Low Pass Filters

LFL15 Series



LFL18 Series



LFL21 Series

(in mm)

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

- Ceramic Filters (CERAFIL®)/Crystal Filters — Cat. No. P51E
- Ceramic Filters (CERAFIL®) Application Manual — Cat. No. P11E

RF Components

Broad lineup of RF Components for RF/Local circuits in communications equipment

Summary

To enhance the technical advantages of communication equipment, Murata offers miniaturized, sophisticated components to meet the demands of many applications.

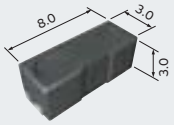
Lineup

●Antennas ●Baluns (Chip Multilayer and Wire Wound/ Film type) ●Couplers (Chip Multilayer and Film type) ●Chip Multilayer Hybrid Dividers ●Chip Multilayer Diplexers ●Microwave Coaxial Connectors ●Single Layer Microchip Capacitors ●Thin Film Circuit Substrate RUSUB®

Antennas

Coil Antennas

Rx 1D-ANT

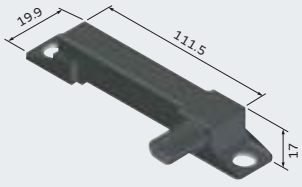


(in mm)

SA3M08 Series

Series	Inductance (mH)	Q (Reference)
SA3M08	1.0 to 18.0	25

Transmitter ANT

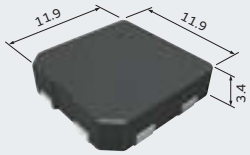


(in mm)

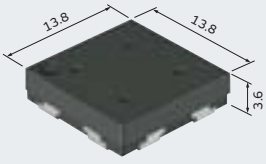
STA8121 Series

Series	Capacitance (pF)	Resonance Frequency
STA8121	2200 to 10000	125kHz, 134.2kHz

Rx 3D-ANT



SA3D12 Series



(in mm)

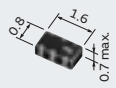
SA3D14 Series

Series		Inductance (mH)	Q (Reference)
SA3D12	X	1.0 to 6.3	20
	Y	1.0 to 6.3	20
	Z	1.0 to 9.0	20
SA3D14	X	1.0 to 6.3	20
	Y	1.0 to 6.3	20
	Z	1.0 to 9.0	20

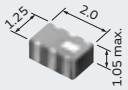
Baluns

SMD baluns constructed with a copper conductor and ceramic material. Ideal for high-frequency applications. Small-size and low-loss baluns can be customized for balance impedance of 50Ω to 200Ω.

Chip Multilayer Type



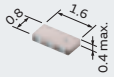
LDB18 Series



LDB21 Series

LDM0Q Series

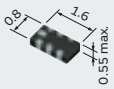
LDM15 Series



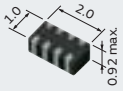
LDM18 Series

(in mm)

Film Type



DXP18B Series

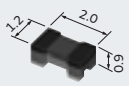


DXP2AB Series

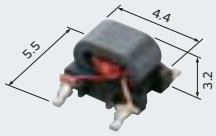
(in mm)

Wire Wound Type

DXW21B Series



DXW21H Series



B4F Series

B5F Series

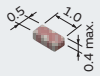
B5FL Series

(in mm)

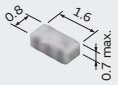
Couplers

An ultra-small, low-profile directional coupler based on ceramic multilayer technology.
This coupler achieves ultra-small size, low insertion loss, and high isolation.

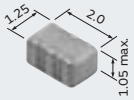
Chip Multilayer Type



LDC15 Series
LDJ15 Series



LDC18 Series
LDJ18 Series

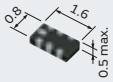


LDC21 Series
LDJ21 Series

*It is available with Integrated LPF for **LDC21 Series**.

(in mm)

Film Type

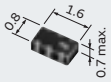


DXP18C Series

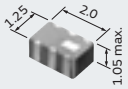
(in mm)

Chip Multilayer Hybrid Dividers

Power divider with a multilayer low pass filter in an ultra-compact package.



LDD18 Series



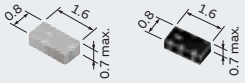
LDD21 Series

(in mm)

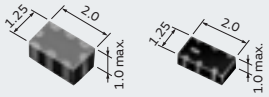
Chip Multilayer Diplexers

A diplexer branching low and high band.
Suitable for band-switching for dual-band system.

LFD15 Series



LFD18 Series



LFD21 Series

LFD2H Series

(in mm)

Microwave Coaxial Connectors

Microwave Coaxial Cable Connectors/Board to Board Connectors

Murata microwave coaxial connectors are small, thin, and suitable for low-profile design.
The connectors have high RF performance.

HSC

MM4829-2702

MM4831-2701

MXHJD3_

JSC

MM5829-2700

MM5831-2700

MXJA01_

MXJGB3_

MXJF56_

KSC

MM6829-2700

MM6831-2700

MXKGB3_

MXKF56_

LSC

MM7829-2700

MM7831-2700

MXLAB3_

MXLF56_

PSC

MM2829-2700

MM2831-2700

MXPEN3_

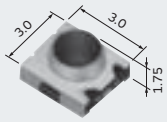
(in mm)

Type	Receptacle Part Number	Pulg Receptacle Part Number (Mating Height (mm))	Cable Number (Mating Height (mm))	Cable Dia. (mm)	Frequency Rating (GHz)	Voltage Standing Wave Ratio
HSC	**MM4829-2702**	**MM4831-2701 (0.9 max.)**	**MXHJD3_ (1.4max.)**	1.13	to 6	1.3 max. (DC to 3GHz)
JSC	**MM5829-2700**	**MM5831-2700 (0.8 max.)**	**MXJA01_ (1.0 max.)**	0.81	to 12	1.3 max. (DC to 3GHz)
			MXJGB3_ (1.0 max.)	0.49	to 6	
			MXJF56_ (1.0 max.)	0.53		
KSC	**MM6829-2700**	**MM6831-2700 (0.6 max.)**	**MXKGB3_ (0.8 max.)**	0.49	to 6	1.3 max. (DC to 3GHz)
			MXKF56_ (0.8 max.)	0.53		
LSC	**MM7829-2700**	**MM7831-2700 (0.6 max.)**	**MXLAB3_ (0.8 max.)**	0.49	to 6	1.3 max. (DC to 3GHz)
			MXLF56_ (0.8 max.)	0.53		
PSC	**MM2829-2700**	**MM2831-2700 (0.88 max.)**	**MXPEN3_ (1.0 max.)**	0.64	to 6	1.3 max. (DC to 3GHz)

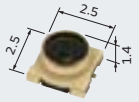
Nominal Impedance: 50Ω
Rated Voltage: 30Vrms
Temperature Range: -40 to 85°C
Mating Height is mated with receptacle.

Microwave Coaxial Connectors with Switch

The coaxial connector with switch is very useful for characteristic measurement in cellular phones and microwave circuits.



MM8430-2610



MM8130-2600

MM8030-2610

MM8930-2600

MM8830-2600

(in mm)

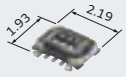
Type	Receptacle Part Number	Frequency Rating (GHz)	Voltage Standing Wave Ratio	Standard Measurement Probe Part Number
SWD	**MM8430-2610**	to 6	1.2 max. (DC to 3GHz)	**MM126320 MXHS83QE3000**
SWF	**MM8130-2600**	to 6	1.2 max. (DC to 3GHz)	
SWG	**MM8030-2610**	to 11	1.2 max. (DC to 3GHz)	**MM126320 MXHQ87WJ3000**
SWH	**MM8930-2600**	to 6	1.2 max. (DC to 3GHz)	**MM126515 MXHQ87PA3000**
SWJ	**MM8830-2600**	to 6	1.2 max. (DC to 3GHz)	**MM126715 MXHQ87PK3000**

Nominal Impedance: 50Ω
Rated Voltage: 30Vrms
Temperature Range: -40 to 85°C

Multi Line Connectors

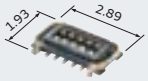
Multi line connectors transmit signals from board to board. The connectors can transmit not only digital signals but also RF signals.

MM3929-2700A03

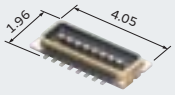


MM3931-2700A03

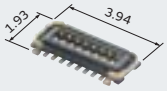
MM3929-2700A05



MM3931-2700A05



MM3929-2700A08



MM3931-2700A08

(in mm)

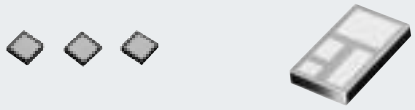
Line Number	Receptacle Part Number	Plug Receptacle Part Number (Mating Height (mm))	Pitch (mm)	Frequency Rating (GHz)	Voltage Standing Wave Ratio
3	**MM3929-2700A03**	**MM3931-2700A03 (0.64 max.)**	0.35	to 6	1.3 max. (DC to 3GHz)
5	**MM3929-2700A05**	**MM3931-2700A05 (0.64 max.)**	0.35	to 6	1.3 max. (DC to 3GHz)
8	**MM3929-2700A08**	**MM3931-2700A08 (0.64 max.)**	0.35	to 6	1.3 max. (DC to 3GHz)

Nominal Impedance: 50Ω
Rated Voltage: 30Vrms
Temperature Range: -40 to 85°C

Single Layer Microchip Capacitors

Very reliable performance and excellent frequency characteristics

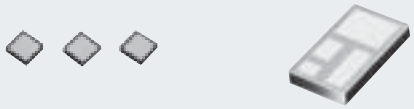
Temperature Compensation Type



Capacitance Change (Temperature Range)	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF) 0.1 1 10 100 1000	Operating Temperature Range (°C)
0±30ppm/°C (-25 to 85°C)	CLB0A	0.25X0.25	100	0.1	-55 to 125
	CLB0C	0.35X0.25	100	0.2	-55 to 125
	CLB0D	0.38X0.38	100	0.2 0.4	-55 to 125
	CLB05	0.5X0.5	100	0.3 0.6	-55 to 125
	CLB0E	0.55X0.38	100	0.5 0.6	-55 to 125
	CLB0F	0.64X0.64	100	0.3 1.0	-55 to 125
	CLB0G	0.7X0.5	100	0.7 1.0	-55 to 125
	CLB0H	0.71X0.38	100	0.7 0.8	-55 to 125
	CLB0J	0.76X0.76	100	0.4 1.3	-55 to 125
	CLB09	0.9X0.9	100	0.5 1.8	-55 to 125
	CLB1A	1.00X0.64	100	1.1 1.6	-55 to 125
	CLB1B	1.09X0.76	100	1.5 2.0	-55 to 125
	CLB1C	1.27X1.27	100	1.0 3.6	-55 to 125
	CLB1E	1.49X0.9	100	2.0 2.7	-55 to 125
	CLB1G	1.73X1.27	100	3.9 4.7	-55 to 125
	CLB1H	1.78X1.78	100	1.8 6.8	-55 to 125
	CLB2C	2.19X1.27	100	5.1	-55 to 125
	CLB2E	2.29X2.29	100	3.0 10	-55 to 125
	CLB2L	2.95X1.78	100	7.5 10	-55 to 125
	CLB3G	3.71X2.29	100	11 16	-55 to 125
-750±60ppm/°C (-25 to 85°C)	CLB0A	0.25X0.25	100	0.3 0.7	-55 to 125
	CLB0B	0.30X0.25	100	0.8	-55 to 125
	CLB0C	0.35X0.25	100	0.9	-55 to 125
	CLB0D	0.38X0.38	100	0.9 1.6	-55 to 125
	CLB05	0.5X0.5	100	1.0 2.4	-55 to 125
	CLB0E	0.55X0.38	100	1.8 2.4	-55 to 125
	CLB0F	0.64X0.64	100	2.0 4.3	-55 to 125
	CLB0G	0.7X0.5	100	2.7 3.0	-55 to 125
	CLB0H	0.71X0.38	100	2.7	-55 to 125
	CLB0J	0.76X0.76	100	3.0 6.2	-55 to 125
	CLB09	0.9X0.9	100	3.3 6.8	-55 to 125
	CLB1A	1.00X0.64	100	4.7 6.2	-55 to 125
	CLB1B	1.09X0.76	100	6.8 7.5	-55 to 125
	CLB1C	1.27X1.27	100	7.5 15	-55 to 125
	CLB1E	1.49X0.9	100	7.5 9.1	-55 to 125
	CLB1H	1.78X1.78	100	13 15	-55 to 125
	CLB2E	2.29X2.29	100	20	-55 to 125

All Single Layer Microchip Capacitors are produced after receiving an order.

High Dielectric Constant Type



Capacitance Change (Temperature Range)	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF) 0.1 / 1 / 10 / 100 / 1000	Operating Temperature Range (°C)
±10% (-25 to 85°C)	CLB0A	0.25X0.25	100	5.6 – 12	-55 to 125
	CLB0B	0.30X0.25	100	13 – 15	-55 to 125
	CLB0C	0.35X0.25	100	16 – 18	-55 to 125
	CLB0D	0.38X0.38	100	18 – 30	-55 to 125
	CLB05	0.5X0.5	100	22 – 43	-55 to 125
	CLB0E	0.55X0.38	100	33 – 43	-55 to 125
	CLB0F	0.64X0.64	100	43 – 75	-55 to 125
	CLB0G	0.7X0.5	100	47 – 68	-55 to 125
	CLB0H	0.71X0.38	100	47 – 56	-55 to 125
	CLB0J	0.76X0.76	100	68 – 110	-55 to 125
	CLB09	0.9X0.9	100	68 – 130	-55 to 125
	CLB1A	1.00X0.64	100	82 – 120	-55 to 125
	CLB1C	1.27X1.27	100	160 – 200	-55 to 125
	CLB1E	1.49X0.9	100	150 – 160	-55 to 125
	CLB1G	1.73X1.27	100	300	-55 to 125
	CLB1H	1.78X1.78	100	300 – 430	-55 to 125
	CLB2E	2.29X2.29	100	470 – 620	-55 to 125
+30, -80% (-25 to 85°C)	CLB0A	0.25X0.25	100	27 – 33	-55 to 125
	CLB0B	0.30X0.25	100	36 – 39	-55 to 125
	CLB0C	0.35X0.25	100	43 – 51	-55 to 125
	CLB0D	0.38X0.38	100	62 – 82	-55 to 125
	CLB05	0.5X0.5	100	75 – 130	-55 to 125
	CLB0E	0.55X0.38	100	91 – 120	-55 to 125
	CLB0F	0.64X0.64	100	130 – 220	-55 to 125
	CLB0G	0.7X0.5	100	150 – 200	-55 to 125
	CLB0H	0.71X0.38	100	130 – 150	-55 to 125
	CLB0J	0.76X0.76	100	200 – 300	-55 to 125
	CLB09	0.9X0.9	100	200 – 390	-55 to 125
	CLB1A	1.00X0.64	100	240 – 360	-55 to 125
+30, -90% (-25 to 85°C)	CLB0A	0.25X0.25	100	36 – 56	-55 to 125
	CLB0D	0.38X0.38	100	91 – 150	-55 to 125
	CLB05	0.5X0.5	100	130 – 220	-55 to 125
	CLB0F	0.64X0.64	100	220 – 390	-55 to 125
	CLB0J	0.76X0.76	100	330 – 560	-55 to 125
	CLB09	0.9X0.9	100	390 – 680	-55 to 125

All Single Layer Microchip Capacitors are produced after receiving an order.

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

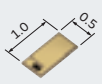
▪ High Frequency Single Layer Microchip Capacitors Cat. No. C01E

Thin Film Circuit Substrate RUSUB®

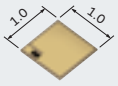
Suitable for photo diode modules.

Features

- RUSUB® technology provides a single-layer capacitor and thin film resistor formed in one chip. It reduces not only the number of parts to build a device, but also the assembly costs. It will also contribute to making a device smaller.
- The single-layer structure makes its self-resonant frequency higher. It allows stable operation even at a high frequency range.
- The short distance between the capacitor and thin film resistor makes the residue inductance smaller and contributes to attenuating unnecessary noise so the device can work at its best characteristics.
- Since it has a gold electrode, it is feasible to be installed inside a module, and it allows wire-bonding with gold wire.
- AuSn pre-coating finish is also available.
- It is very suitable for APD (Avalanche Photo Diode), because the capacitor has a withstanding voltage of 100V.



RUCYT101 Series



RUCYT201 Series

(in mm)

- Six types of standard samples of RUSUB® C+R (Capacitor + Resistor) are available.
- Custom substrate size, capacity, resistance value, and electrode pattern shape is available upon request.

Part Number	Size (mm) (LXWXT)	Capacitance (pF)	Resistance (Ω)	Temperature Characteristics of Capacitance at -25 to 85°C	Capacitor Rated Voltage (V)	Temperature Coefficient of Resistance (ppm/°C)	Resistor Rated Power (mW/mm²)
RUCYT101K00009GNTC	1.0X0.5X0.11	100±10%	50±20%	±10%	100	-70±50	100
RUCYT101K00011GNTC	1.0X0.5X0.11	100±10%	100±20%				
RUCYT101K00012GNTC	1.0X0.5X0.11	100±10%	200±20%				
RUCYT201K00010GNTC	1.0X1.0X0.12	200±10%	50±20%				
RUCYT201K00013GNTC	1.0X1.0X0.12	200±10%	100±20%				
RUCYT201K00014GNTC	1.0X1.0X0.12	200±10%	200±20%				

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

- Thin Film Circuit Substrate (RUSUB®) Cat. No.M04E

Sensors

Summary

Murata pursued sensing functions making full use of MEMS and processing technology, and magnetoresistive elements including ceramic material technology in order to develop highly efficient and highly reliable devices, modules, and systems.
A lineup of various sensors respond to the sensing needs of various applications for automobile, wearable, medical care, and health care.

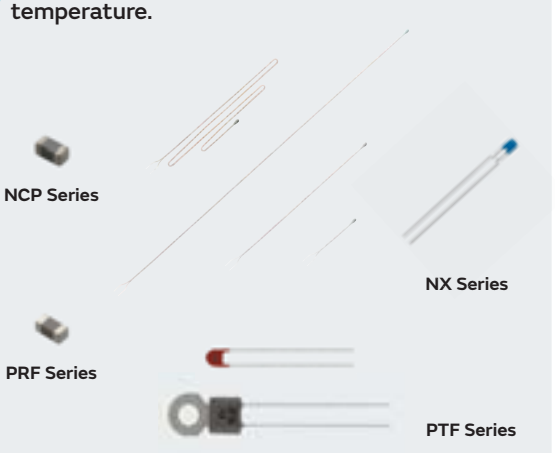
Lineup

●Infrared Sensors ●Ultrasonic Sensors ●Rotary Sensors ●Magnetic Pattern Recognition Sensors ●AMR Sensors (Magnetic Sensors) ●Shock Sensors ●Accelerometers ●Inclinometers ●Gyro Sensors ●Rotary Position Sensors ●Encoder Switch ●Barometric Pressure Sensors ●Temperature Sensors (Thermistors)

Sensor Guide (Select by Method/Principle)

Temperature

Thermistors: The resistance changes with the temperature.



Infrared

Pyroelectric infrared sensors: The sensor reacts to the infrared radiation emitted from the human body to output an electric charge.

IRA Series

For more details on Thermistors, please refer to p. 72.

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

▪ MEMS Sensors & Sensing Elements	Cat. No. S47E
▪ Rotary Position Sensors	Cat. No. R51E
▪ NTC Thermistors	Cat. No. R44E
▪ POSISTOR® for Circuit Protection	Cat. No. R90E
▪ NTC/PTC Thermistors for Automotive	Cat. No. R03E

Distance

Ultrasonic sensors: The sensor sends and receives ultrasonic waves in order to detect distances from the state of the reflected wave.

MA300D1-1
(for Dual Use)

MA40S4R (for Receiver)
MA40S4S (for Transmitter)

MA58MF14-7N
(for Dual Use)

Open and Shut

Magnetic switches: This switch switches built-in ICs when the magnetoresistive element detects the magnetic proximity.

MR Series

Inertial force

Shock sensors: This sensor generates an electric charge according to the acceleration (stress) applied to the piezoelectric element.

PKGS Series

Accelerometers: This sensor detects the acceleration from the change of the capacitance that occurs in the 3DMEMS element.

SCA Series

Inclinometers: This sensor detects the gravitational acceleration of the Earth to calculate the angle of gradient.

SCA Series

Gyro sensors: This sensor detects the angular velocity from the change in the capacitance that occurs in the 3DMEMS element.

SCC Series
SCR Series

Magnetic

Rotary sensors: This sensor detects the motion of magnetic gears by a built-in magnet and magnetoresistive element.

FR Series

Magnetic switches: This switch switches built-in ICs when the magnetoresistive element detects magnetism.

MR Series

Magnetic pattern recognition sensors: This sensor identifies magnetic ink by the combination of a built-in magnet and magnetoresistive element.

BS Series

Pressure

Barometric pressure sensors: This sensor detects the atmospheric pressure applied to the 3DMEMS element by the capacitance.

ZPA Series

Angle

Rotary position sensors: The resistance changes in proportion to the angle.

SV03 Series

Lineup

Detection	Murata's Sensors			Applications											
				AV Equipment					Communications Devices						
	Products	Series or Main Part Number	Dimensions (mm)	TV	Audio	DVD, CD	Digital Video Camera	Digital Camera	PC	Scanner	Multifunction Machine	Printer	FAX	Electronic Bulletin Board	
Infrared	Pyroelectric Infrared Sensors	**IRA Series**	ø9.2 H4.7	●	●	●			●	●	●	●	●	●	
Ultrasonic	Open Structure Type Ultrasonic Sensors	**MA40S4R** (for Receiver) **MA40S4S** (for Transmitter)	ø9.9 H7.1											●	
	Drip-proof Type Ultrasonic Sensors	**MA58MF14-7N** (for Dual Use)	ø14.0 H9.0												
	High Frequency Type Ultrasonic Sensors	**MA300D1-1** (for Dual Use)	ø9.9 H7.3							●	●	●			
Magnetic	Rotary Sensors	**FR Series**	ø22.5 H12.5												
	Magnetic Pattern Recognition Sensors	**BS Series**	11.15X8.8X12.5 193.0X16.0X7.5												
	AMR Sensors (Magnetic Sensors)	**MR Series**	MRMS201A: 2.8X2.9X1.1 MRMS501A: 1.45X1.45X0.55			●	●	●	●						
Acceleration	Shock Sensors	**PKGS Series**	3.2X2.0X1.05						●						
	Accelerometers	**SCA Series**	10.48X11.31X5.08												
	Inclinometers	**SCA Series**	15.58X11.31X5.08								●				
Angle Velocity	Gyro Sensors	**SCC Series** **SCR Series**	8.5X18.7X4.5												
Angle	Rotary Position Sensors	**SV03 Series**	11X12X2.1	●				●			●	●			
Rotary	Encoder Switch micro ES	**SVM3 Series**	3.4X3.2X2.3		●										
Atmosphere Pressure	Barometric Pressure Sensors	**ZPA Series**	2.6X2.3X0.875												
Temperature	NTC Thermistors	**Chip Type NCP Series**	NCP03: 0.6X0.3X0.3 NCP15: 1.0X0.5X0.5 NCP18: 1.6X0.8X0.8 NCP21: 2.0X1.25X0.85	●	●	●	●	●	●	●	●	●	●	●	
		Lead Type NX Series	NXF: ø1.2 L25 to 150 NXR: ø4.0 L10 to 40	●	●				●	●	●	●	●	●	
	PTC Thermistors POSISTOR®	**Chip Type PRF Series**	PRF15: 1.0X0.5X0.5 PRF18: 1.6X0.8X0.8 PRF21: 2.0X1.25X0.9	●	●	●	●	●	●	●	●	●	●	●	
		Lead Type PTF Series	ø5.0 max. T4.0 max. ø7.5 T3.0	●	●				●	●	●	●	●	●	

Applications																														Murata's Sensors
Home Electronics												Security				Car Electronics			Toy		Others							Wearable		
Refrigerator	Electric Rice-cooker	Air Conditioner	Air Purification System	Humidifier	Cleaner	Laundry Machine	Food Fan	Water Heater	Toilet Seats with a Warm-water Shower Feature	Lighting	Security Camera	Security Light	Indoor Security Sensor	Intrusion Detection Sensor	Navigation System	Climate Control	Parking Assist	Radio Control (Attitude Control)	Game Controller	Machine Tool	ATM, CD	Vending Machine	Amusement Machine	Construction Machinery	Farm Machinery	Railroad Equipment				Products
●	●	●	●							●	●	●	●	●							●	●	●							Pyroelectric Infrared Sensors
●		●			●					●	●	●	●	●							●	●	●							Open Structure Type Ultrasonic Sensors
																	●													Drip-proof Type Ultrasonic Sensors
																					●									High Frequency Type Ultrasonic Sensors
																				●				●	●	●				Rotary Sensors
																					●	●	●							Magnetic Pattern Recognition Sensors
●	●	●	●	●	●	●	●	●	●	●				●						●	●	●	●							AMR Sensors (Magnetic Sensors)
																				●										Shock Sensors
						●														●			●	●	●					Accelerometers
																				●				●	●					Inclinometers
						●									●					●			●	●	●					Gyro Sensors
●		●				●		●	●	●	●								●	●			●							Rotary Position Sensors
																											●			Encoder Switch micro ES
					●													●	●				●				●			Barometric Pressure Sensors
●	●	●	●	●	●	●	●	●	●	●					●				●			●	●						NTC Thermistors
●	●	●	●	●	●	●	●	●	●	●												●	●							
●	●	●	●	●	●	●	●	●	●	●					●				●				●							PTC Thermistors POSISTOR®
				●	●	●	●	●	●	●													●							

Thermistors

Facilitate your designs and products utilizing our thermal design and thermistor products.

Summary

Murata's semi-conductive ceramics and electrode printing technologies, such as PTC and NTC Thermistors, provide vital protection and sensing within electronic equipment. Simulation software tools are also available for your convenience.

Lineup

●NTC Thermistors for temperature sensor/compensation, and automotive

●PTC Thermistors POSISTOR® for overheat sensing, overcurrent protection, inrush current suppression, and automotive

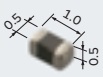
NTC Thermistors for Temperature Sensor/ Temperature Compensation

Chip Type

Chip NTC Thermistors have Ni barrier terminations, provide excellent solderability, and offer high stability in harsh environments due to their unique inner construction.

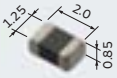
NCP02 Series

NCP03 Series



NCP15 Series
NCU15 Series

NCP18 Series
NCU18 Series



NCP21 Series

(in mm)

Series	Size Code inch (mm)	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Permissive Operating Current (25°C) (mA)	Rated Electric Power (25°C) (mW)	Typical Dissipation Constant (25°C) (mW/°C)	Operating Temperature Range (°C)
NCP02	01005 (0402)	10k/100k	3380/4250	0.31/0.01	100	1	-40 to 125
NCP03	0201 (0603)	1.0k to 220k	3500 to 4485	0.06 to 9.5	100	1	-40 to 125
NCP15	0402 (1005)	220 to 470k	3500 to 4500	0.04 to 2.10	100	1	-40 to 125
NCU15	0402 (1005)	10k to 100k	3380 to 4250	0.1 to 0.31	100	1	-40 to 125
NCP18	0603 (1608)	220 to 470k	3500 to 4500	0.04 to 2.10	100	1	-40 to 125
NCU18	0605 (1608)	10k to 100k	3380 to 4250	0.1 to 0.31	100	1	-40 to 125
NCP21	0805 (2012)	220 to 100k	3500 to 4250	0.14 to 3.0	200	2	-40 to 125

Rated Electric Power shows the required electric power that causes the Thermistor's temperature to rise to 125°C by self heating, at ambient temperature of 25°C.
There are also items for automotive applications in the NCP/NCU Series.

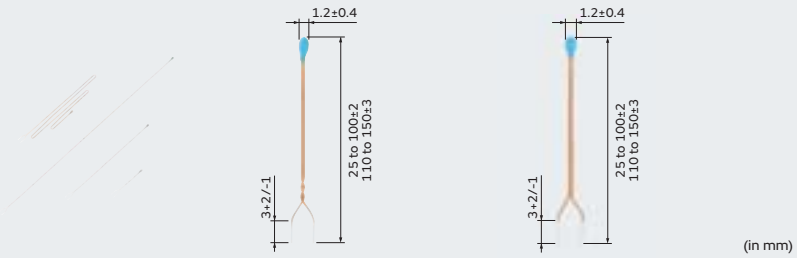
Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

- NTC Thermistors — Cat. No. R44E
- POSISTOR® for Circuit Protection — Cat. No. R90E
- NTC/PTC Thermistors for Automotive — Cat. No. R03E

Thermo String Type

Small flexible lead type NTC Thermistors with a small head and a thin lead wire.



Twist
NXFT15_1B Series

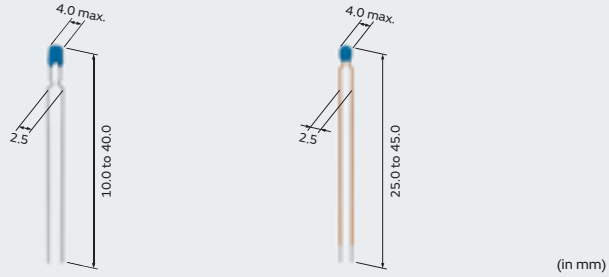
Without twist
NXFT15_2B Series

Series	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Operating Current for Sensor (25°C) (mA)	Thermal Time Constant (25°C) (s)	Full Length (mm)	Operating Temperature Range (°C)
NXFT15	10k to 100k	3380 to 4250	0.04 to 0.12	4	25 to 150	-40 to 125

Operating Current for Sensor raises the Thermistor's temperature by 0.1°C.
There are also items for automotive applications in the NXF Series.

Lead Type

This product is a thermistor for normal temperature level sensors having self-subsistence due to strong lead strength based on chip NTC.



NXRT15 Series

NXRT15/Insulation Series*

Series	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Operating Current for Sensor (25°C) (mA)	Thermal Time Constant (25°C) (s)	Full Length (mm)	Operating Temperature Range (°C)
NXRT15	2k to 100k	3380 to 4250	0.04 to 0.27	4	10 to 40	-40 to 125
NXRT15 (Insulation*)	2k to 100k	3380 to 4250	0.05 to 0.36	4	25 to 35	-40 to 125

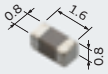
Operating Current for Sensor raises the Thermistor's temperature by 0.1°C.
There are also items for automotive applications in the NXR Series.
*Insulation: Lead wire insulation type.

PTC Thermistors POSISTOR® for Overheat Sensing

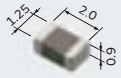
Chip Type

For overheat sensing for power transistors, power diodes, and power ICs in hybrid circuits.

PRF15 Series



PRF18 Series



PRF21 Series

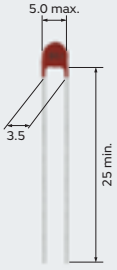
(in mm)

Series	Sensing Temperature Range (°C) 60 70 80 90 100 110 120 130 140 150	Sensing Temperature Tolerance (°C)	Maximum Voltage (V)	Size Code inch (mm)
PRF15		±3/±5	32	0402 (1005)
PRF18		±3/±5	32	0603 (1608)
PRF21		±5	32	0805 (2012)

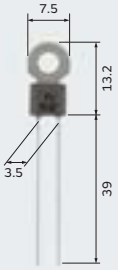
There are also items for automotive applications in the PRF Series.

Lead Type

For protecting power transistors, stereo main amplifiers, etc., from overheating, and also for sensing the temperature of other components that may be overheated.



PTFL Series



PTFM Series

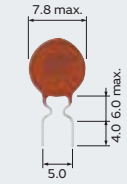
(in mm)

Series	Sensing Temperature Range (TS) (°C) 60 70 80 90 100 110 120 130 140 150	Maximum Voltage (V)	Resistance (25°C) (max.) (Ω)	Resistance (TS-10°C) (max.) (Ω)	Resistance (TS°C) (min.) (Ω)
PTF□_471Q		16	100	330	470
PTF□_222Q		16	330	1.5k	2.2k

The blank is filled with type codes. (L: Lead type, M: with lug-terminal)
Operating Temperature Range is -10 to TS+10°C.

PTC Thermistors POSISTOR® for Inrush Current Suppression

This series is able to support overcurrent or inrush current issues on the power supply circuit.



PTGL07AS Series

PTGL14 to 20AS Series

(in mm)

Series	Resistance (25°C) (Ω)	Maximum Voltage (V)	Maximum Inrush Current (Ao-p)	Maximum Charge Energy (J)	Operating Temperature Range (°C)
PTGL07AS	120 to 200	280	5.66 to 8.46	7.8 (105°C)	-40 to 105
PTGL14 to 20AS	33 to 100	280	13 to 39	56.9 to 181.7 (65 to 85°C)	-20 to 85

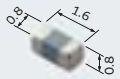
Maximum Inrush Current shows the maximum inrush current value introduced into the Posistor at operating temperature range.

PTC Thermistors POSISTOR® for Overcurrent Protection

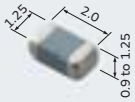
Chip Type

Overcurrent Protection device with resettable function suitable for current-limiting resistors.

PRG15 Series



PRG18 Series



PRG21 Series

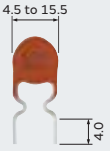
(in mm)

Series	Maximum Voltage (V)	Hold Current (60°C) (mA)	Trip Current (-10°C) (mA)	Maximum Current (A)	Resistance (25°C) (Ω)	Size Code inch (mm)
PRG15	6 to 30	17 to 88	78 to 318	0.6 to 3.5	2.2 to 68	0402 (1005)
PRG18	6 to 30	7 to 220	25 to 850	0.06 to 7.5	2.2 to 470	0603 (1608)
PRG21	6 to 30	30 to 500	110 to 2000	1.1 to 10	0.2 to 22	0805 (2012)

Maximum Current shows typical transformer capacities that can be used.
There are also items for automotive applications in the PRG Series.

Lead Type

Best suited to meet the requirements of power supplies and motor protection.
Error-free operation is ensured by rush current.



(in mm)

PTGL Series
*The Lead shape is an example.

Series	Maximum Voltage (V)	Hold Current (60°C) (mA)	Trip Current (-10°C) (mA)	Maximum Current (A)	Resistance (25°C) (Ω)
PTGL	16	370 to 1200	1040 to 3360	2.0 to 10.0	0.15 to 1.0
	24	80 to 180	320 to 710	2.0	2.2 to 10
	30	122 to 685	240 to 1900	0.7 to 7.0	0.8 to 13
	32	30 to 60	140 to 240	1.5	15 to 47
	51	168 to 592	332 to 1168	1.0 to 5.0	1.2 to 10
	56	90 to 380	240 to 980	1.0 to 2.5	3.3 to 22
	60	88 to 439	175 to 867	1.0 to 5.0	2.2 to 22
	80	50 to 310	135 to 860	0.7 to 5.5	3.7 to 55
	125	30 to 420	75 to 1050	0.3 to 2.0	3.3 to 180
	140	74 to 340	147 to 780	0.5 to 3.5	4.7 to 56
	250	90 to 100	280 to 300	0.5 to 0.6	12 to 39
	265	28 to 300	78 to 830	0.2 to 4.1	6.0 to 180

Maximum Current shows typical transformer capacities that can be used.
There are also items for automotive applications in the PTGL Series.

Power Devices

Eco-friendly and high-quality power devices

Summary

To meet consumer needs Murata offers power supply products and energy devices that can be used with a variety of equipment, such as video equipment, household information appliances, and communication/transfer equipment. Murata provides standard and customized products using highly reliable. Murata makes components utilizing advanced design and high-density packaging technology.

Lineup

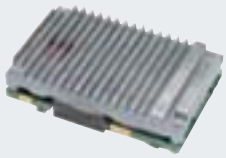
- DC-DC Converters
- High Voltage Power Supplies
- Switching Power Supplies

DC-DC Converters

DC-DC converters are vital to the demands of electronic equipment.
Murata offers DC-DC converters that set the standard for miniaturization, low-profile, high-efficiency, power-saving and low-noise power supplies. Murata also provides standard products and customized products, ultra-low-profile products, and products for FPGAs.

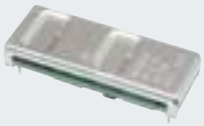
Isolated Type

MYBQC01138AZTB

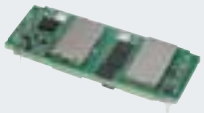


MYBQC01138AZTF

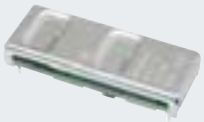
MYBEA01212AZT



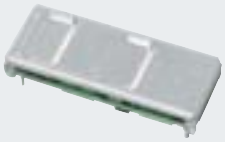
MYBEA01212AZTB



MYBEA01210CZT



MYBEA01210CZTB



MYBEB01212AZTB

MYBTA00512ABT

Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Isolation Voltage (VDC)	Footprint (Brick)	Size (mm) LXWXH
MYBQC01138AZTB	Insert	48V (36V to 75V)	400	10.6±6%	38	95	1500	1/4	58.4X36.8X14 max.
MYBQC01138AZTF	Insert	48V (36V to 75V)	400	10.6±6%	38	95	1500	1/4	58.4X36.8X17 max.
MYBEA01212AZT	Insert	48V (36V to 75V)	140	12±3%	12	92.5	1500	1/8	58.4X22.8X9 max.
MYBEA01212AZTB	Insert	48V (36V to 75V)	140	12±3%	12	92.5	1500	1/8	58.4X22.8X9 max.
MYBEA01210CZT	Insert	24V (18V to 36V)	120	12±3%	10	93	1500	1/8	58.4X22.8X9 max.
MYBEA01210CZTB	Insert	24V (18V to 36V)	120	12±3%	10	93	1500	1/8	58.4X22.8X9 max.
MYBEB01212AZTB	Insert	48V (36V to 75V)	100	12±3%	8.3	92	2250	1/8	58X22.8X12.7 max.
MYBTA00512ABT	SMD	48V (36V to 75V)	60	5±3%	12	92	2250	1/32	23.36X19.05X12.7 max.

These are just a few examples of our large assortment of power products.

Isolated DC-DC Converter for PoE + PD

MYBSP0055AABF
MYBSP0122BABF

Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Isolation Voltage (VDC)	Size (mm) LXWXH
MYBSP0055AABF	SMD	54V (42.5V to 57V)	25.5	5.0±3%	5.1	90.5	2250	35.5X22.4X10.55 max.
MYBSP0122BABF	SMD	54V (42.5V to 57V)	25.5	12.0±3%	2.125	92.5	2250	35.5X22.4X10.55 max.

Non-isolated Type

MPDRX307S
MPDRX308S

MPDRX312S

MPDTY461S
MPDTY462S

MYGTM01210BZN

MYLSM00502ERPL

MYMGK00506ERSR
MYMGK1R806FRSR

MYMGK1R820ERSR
MYMGK1R820FRSR

MYSSM01806BENL

MYUSP3R303FMP

OKL2-T/12-W12N2-C

OKL2-T/12-W5N-C

OKL2-T/20-W12N2-C
OKL2-T/20-W12P2-C

OKL2-T/20-W5N-C
OKL2-T/20-W5P-C

OKL-T/3-W5N-C

OKL-T/6-W12P-C

Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Size (mm) LXWXH
MPDRX307S	SMD	6.2 to 13.2	23.6	1.8 to 3.63	6.5	91	17.6X20.2X4.2
MPDRX308S	SMD	6.2 to 13.2	10.7	0.8 to 1.65	6.5	82	17.6X20.2X4.2
MPDRX312S	SMD	3 to 5.5	28.8	0.8 to 1.8	16	86.5	27.8X15.4X4.2
MPDTY461S	SMD	4.5 to 14	94	1.6 to 3.63	26	90.5	33.02X13.46X4.2
MPDTY462S	SMD	4.5 to 14	43	0.75 to 1.65	26	85.5	33.02X13.46X4.2
MYGTM01210BZN	SIL	17 to 40	120	5 to 12	10	97.3	40X40.3X29.2
MYLSM00502ERPL	SMD	8 to 16	12.5	1 to 5.25	2.5	85	7.9X7.9X2.3
MYMGK00506ERSR	SMD	8 to 14	30	0.7 to 5.0	6	95.4	9.0X7.5X5.0
MYMGK1R806FRSR	SMD	4.5 to 5.5	10.8	0.7 to 1.8	6	90.4	9.0X7.5X5.0
MYMGK1R820ERSR	SMD	8 to 14	36	0.7 to 1.8	20	87.8	10.5X9.0X5.6
MYMGK1R820FRSR	SMD	4.5 to 5.5	36	0.7 to 1.8	20	89.2	10.5X9.0X5.6
MYSSM01806BENL	SMD	25 to 40	108	5 to 18	6	96.5	30.2X20.9X12
MYUSP3R303FMP	SMD	3 to 5.5	9.9	0.7 to 3.3	3	94	11X8.5X5.6

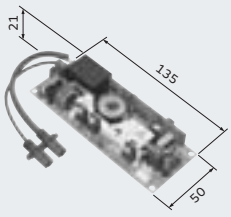
These are just a few examples of our large assortment of power products.

Continued on the following page. ↗

Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Size (mm) LXWXH
OKL2-T/12-W12N2-C	SMD	4.5 to 14	60	0.69 to 5.5	12	95	20.32X11.43X8.55
OKL2-T/12-W5N-C	SMD	2.4 to 5.5	39.6	0.6 to 3.63	12	94	20.32X11.43X8.55
OKL2-T/20-W12N2-C	SMD	4.5 to 14	100	0.69 to 5.5	20	94	33.02X13.46X8.75
OKL2-T/20-W12P2-C	SMD	4.5 to 14	100	0.69 to 5.5	20	94	33.02X13.46X8.75
OKL2-T/20-W5N-C	SMD	2.4 to 5.5	66	0.6 to 3.63	20	93.1	33.02X13.46X8.75
OKL2-T/20-W5P-C	SMD	2.4 to 5.5	66	0.6 to 3.63	20	93.1	33.02X13.46X8.75
OKL-T/3-W5N-C	SMD	2.7 to 5.5	10.9	0.6 to 3.63	3	95.3	12.2X12.2X6.2
OKL-T/6-W12P-C	SMD	4.5 to 14	33	0.591 to 5.5	6	93	12.2X12.2X7.2

These are just a few examples of our large assortment of power products.

High Voltage Power Supplies



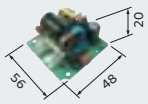
(in mm)

MPL3000 Series (AC/DC Ballast)

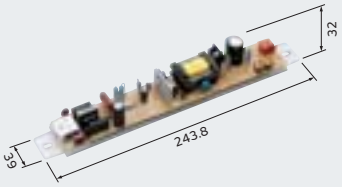
Series	Applications	Input Voltage Vin	Output Power	Other Specification
MPL3000 (AC/DC Ballast)	Projector	250 to 420V DC	to 350W	For extra-high pressure mercury lamp

For more details on our products, please contact us.

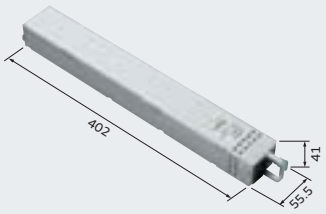
Switching Power Supplies



Energy Management Equipment



LED Lighting



HVDC

(in mm)

Applications	Input Voltage	Output Voltage	Safety Standard	EMI Standard	Remarks
Energy Management Equipment	60 to 225V AC	3.3V 24V	UL, IEC	VCCI, CISPR	
LED Lighting	90 to 264V AC	24V	IEC, PSE	VCCI, CISPR	PWM Dimming, Accepted for DALI, UART
HVDC	200 to 400V DC	12.12V	-	VCCI	PMBus

For more details on our products, please contact us.

For Ionizer Modules, please refer to p. 93.

Energy Devices/Batteries

Solutions for power lines of various devices and equipment

Summary

Murata offers various energy solutions that can be applied for a wide range of applications, such as energy devices and batteries for low-power, small electronic equipment such as portable or wearable devices, energy storage systems for household and business use.

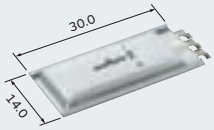
Lineup

- Supercapacitors (EDLC)
- Small Energy Devices
- Li-ion Energy Storage System
- Micro Batteries

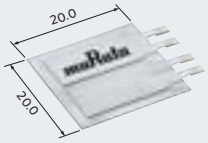
Supercapacitors (EDLC)

Supercapacitors (EDLC) are energy storage devices with high power density characteristics. Murata has focused its R&D efforts on electrical double-layer energy devices, and also established collaboration with the component design and manufacturing firm CAP-XX Limited (CAP-XX). This has led to Murata's development of Supercapacitor technology resulting in low ESR and high capacitance in a very small package.

DMT3N4R2U224M3DTA0
DMT334R2S474M3DTA0
DMF3Z5R5H474M3DTA0



DMF4B5R5G105M3DTA0



DMHA14R5V353M4ATA0

(in mm)

Series	Main Part Number	Thickness (mm)	Capacitance (mF)	Rated Voltage (V)	ESR (mΩ)	Operating Temperature (°C)
DMT (General-Purpose Type)	**DMT3N4R2U224M3DTA0**	2.0	220	4.2	300	-40 to 85
	DMT334R2S474M3DTA0	3.5	470	4.2	130	-40 to 85
DMF (High Peak Power Type)	**DMF3Z5R5H474M3DTA0**	3.2	470	5.5 (Peak Voltage)	45	-40 to 70
	DMF4B5R5G105M3DTA0	3.7	1000	5.5 (Peak Voltage)	40	-40 to 70
New DMH (Ultra-Thin Type)	**DMHA14R5V353M4ATA0**	0.4	35	4.5	300	-40 to 85

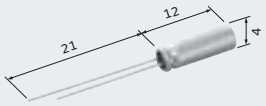
Detailed Catalogs

For more details, please refer to our PDF catalogs on our website.

- High Performance Supercapacitor (EDLC) DMF Series Cat. No. O83E
- High Performance Supercapacitor (EDLC) DMT Series Cat. No. O84E

Small Energy Devices

Murata's small energy devices are miniature devices with a high energy storage capacity, low ESR, fast charging and discharging, and the ability to withstand load fluctuations. It may be used as a secondary battery in the same way as a capacitor. This energy device achieves better charge/discharge characteristics and has an extended service life superior to conventional batteries. Well suited as a power supply for wearable devices or sensor nodes for wireless sensor networks. This device maintains flat voltage characteristics while accommodating a wide range of load characteristics.



UMAC040130A003TA01

UMAL361421B024TA01

(in mm)

Series	Part Number	Nominal Voltage (V)	Charge Voltage (V)	Cut-off Voltage (V)	Nominal Capacity (mAh)	Maximum Discharge Current	ESR (mΩ)	Operating Temperature Range (°C)
UMAC (Cylinder Type)	**UMAC040130A003TA01**	2.3	2.7	1.8	3	30mA (10C)	800	-20 to 70
UMAL (Thin Laminate Type)	**UMAL361421B024TA01**	2.3	2.7	1.8	24	240mA (10C)	100	-20 to 70

Li-ion Energy Storage System

Possible to customize voltage and capacity in order to meet wide usage

2.1kWh Energy Storage Module

(in mm)

(Excluding terminal)
IJ1101M
27kg

Model Name	Nominal Capacity	Rated Capacity	Nominal Voltage	Maximum Discharge Current	Charge Voltage	Maximum Charge Current	Safety Standard
IJ1101M	2.1kWh (42.0Ah)	2.0kWh (39.5Ah)	51.2V	50A	56.0V	40A	EU RE Directive UL 1973 FCC Part15 Class B

Storage Temperature: -20 to 45°C (Room temperature recommended)
Operating Ambient Temperature: Discharge: -20 to 40°C (Discharge current ≦ 50.0A)
40 to 50°C (Discharge current ≦ 40.0A)
Charge: 10 to 45°C (Charge current ≦ 40.0A)
0 to 10°C (Charge current ≦ 12.0A)

High Rate Module

(in mm)

(Excluding terminal)
IJ1201M
18kg

*use for Japan market

Model Name	Nominal Capacity	Rated Capacity	Nominal Voltage	Maximum Discharge Current	Charge Voltage	Maximum Charge Current	Safety Standard
IJ1201M	1.2kWh (24Ah)	1.15kWh (22.5Ah)	51.2V	90A	56.0V	22.5A	-

Storage Temperature: -20 to 45°C (Room temperature recommended)
Operating Ambient Temperature: Continuous Discharge: 0 to 30°C (Discharge current ≦ 90.0A)
30 to 35°C (Discharge current ≦ 75.0A)
35 to 40°C (Discharge current ≦ 67.5A)
Non Continuous Discharge: 30 to 40°C (Discharge current ≦ 90.0A, Time ≦ 60 sec)
Charge: 10 to 40°C (Charge current ≦ 22.5A)
0 to 10°C (Charge current ≦ 6.75A Recommended)

BMU (Battery Management Unit)

(Excluding terminal)
IJ5101C
12kg

*use for Japan market

(in mm)

(Excluding terminal)
IJ8101C
14kg

Model Name	Operating Voltage	Operating Current	Communication Interface	Configuration	Safety Standard
IJ5101C	60 to 420V	0 to 100A	RS232C/RS485C	Series: to 7 series Mix Combination: to 6 series and to 2 parallels Maximum module connections: 32 modules	-
IJ8101C	300 to 1000V	0 to 100A	RS232C/RS485C	Series: to 16 series Mix Combination: to 16 series and to 2 parallels	EU LV Directive EU EMC Directive UL 1973 FCC Part15 Class B *It is certificated along with IJ1101M. *UL 1973 is certified for maximum of 90 A.

Storage Temperature: -20 to 65°C (Room temperature recommended)
Operating Ambient Temperature: -20 to 50°C (Room temperature recommended)

BMU-HUB

(in mm)

(Excluding terminal)
IJ1101K
3.4kg

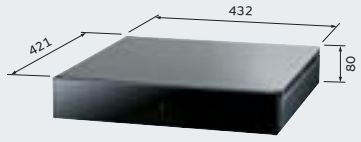
Model Name	Operating Voltage	Purpose	Configuration	Safety Standard
IJ1101K	DC12V, DC24 to 60V	Interface unit to connect IJ8101C for utility	Parallel: to 64BMU Maximum module connections: 64X32=2048 modules (maximum 4.3MWh)	EU EMC Directive FCC Part15 Class B

Storage Temperature: -20 to 65°C (Storage and use in room temperature is recommended)
Operating Ambient Temperature: -20 to 60°C (Storage and use in room temperature is recommended)

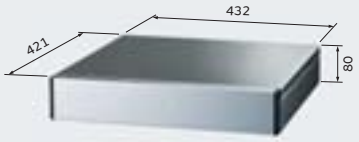
Cable

Model Name	Type	Specification
IJT-102F	Communication Cable 20cm	RS485
IJT-103F	Communication Cable 30cm	RS485
IJT-115F	Communication Cable 150cm	RS485
IJT-130F	Communication Cable 300cm	RS485
IJD-103F/R	Thicker Power Cable 30cm (red)	AWG4
IJD-103F/B	Thicker Power Cable 30cm (black)	AWG4
IJD-110F/R	Thicker Power Cable 100cm (red)	AWG4
IJD-110F/B	Thicker Power Cable 100cm (black)	AWG4

1.2kWh Energy Storage Module



(Excluding terminal)
IJ1001M
Black
17kg



(in mm)

(Excluding terminal)
IJ1001M
Silver
17kg

Model Name	Front Color	Nominal Capacity	Rated Capacity	Nominal Voltage	Maximum Discharge Current	Charge Voltage	Maximum Charge Current	Safety Standard
IJ1001M	Black	1.2kWh (24Ah)	1.1kWh (22Ah)	51.2V	50.0A	57.6V	24.0A	EU EMC Directive UL 1973 FCC Part15 Class B *UL 1973 Certification covers only parallel connection.
IJ1001M	Silver	1.2kWh (24Ah)	1.1kWh (22Ah)	51.2V	50.0A	57.6V	24.0A	

Storage Temperature Range: -40 to 65°C (Room temperature recommended)
Operating Ambient Temperature Range: Discharge: -20 to 60°C (Discharge current ≦ 24.0A)
-20 to 40°C (Discharge current ≦ 50.0A)
Charge: 10 to 45°C (Charge current ≦ 24.0A)
0 to 10°C (Charge current ≦ 7.2A)

Controller

(Excluding terminal)
IJ1004C
8kg

(Excluding terminal)
IJ5001C
8kg

(in mm)

Model Name	Front Color	Operating Voltage	Operating Current	Communication Interface	Configuration	Safety Standard
IJ1004C	Black	30 to 60V	0 to 180A	RS232C/CAN	Parallel: to 16 parallel	EU EMC Directive FCC Part15 Class B
IJ5001C	Silver	100 to 480V	0 to 50A	RS232C/CAN	Series: 3 to 8 series Mix Combination: to 8 series and to 2 parallel	EU LV Directive EU EMC Directive FCC Part15 Class B

Storage Temperature: -40 to 65°C (Room temperature recommended)
Operating Temperature: IJ1004C -20 to 45°C (Room temperature recommended)
IJ5001C -20 to 60°C (Room temperature is recommended)

Cable・Connecter

Model Name	Type	Specification
IJT-003F	Communication Cable 30cm	I2C
IJT-010F	Communication Cable 100cm	I2C
IJC-108F	Communication Cable 20cm & 80cm	CAN Junction
IJD-103F/R	Thicker Power Cable 30cm (red)	AWG4
IJD-103F/B	Thicker Power Cable 30cm (black)	AWG4
IJD-110F/R	Thicker Power Cable 100cm (red)	AWG4
IJD-110F/B	Thicker Power Cable 100cm (black)	AWG4

Bracket

Model Name	Color	Specification
IJB-001F/B	Black	Bracket 2pcs, Screw ASSY M4 x 8 4pcs
IJB-001F/S	Silver	Bracket 2pcs, Screw ASSY M4 x 8 4pcs

Coin Manganese Dioxide Lithium Batteries

Coin manganese dioxide lithium batteries are small-sized primary batteries for various applications such as TPMS (Tire Pressure Monitoring System) or smart entry systems for automobile, IoT devices and backup power source for memory.

Standard Type

Model	Electrical Characteristics			Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Standard Discharge Current (mA)	Diameter (mm)	Height (mm)	Weight (g)	
CR1216	3	30	0.1	12.5	1.6	0.7	-30 to 70
CR1220	3	40	0.1	12.5	2.0	0.8	-30 to 70
CR1616	3	60	0.1	16.0	1.6	1.1	-30 to 70
CR1620	3	80	0.1	16.0	2.0	1.3	-30 to 70
CR1632	3	140	0.2	16.0	3.2	1.9	-30 to 70
CR2016	3	90	0.1	20.0	1.6	1.7	-30 to 70
CR2025	3	160	0.2	20.0	2.5	2.6	-30 to 70
CR2032	3	220	0.2	20.0	3.2	3.2	-30 to 70
CR2430	3	300	0.2	24.5	3.0	4.3	-30 to 70
CR2450	3	610	0.2	24.5	5.0	6.6	-30 to 70
CR2477	3	1000	0.4	24.5	7.7	10.0	-30 to 70

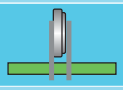
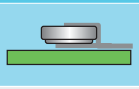
Heat-resistant Type

Model	Electrical Characteristics			Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Recommended Continuous Discharge Current (mA)	Diameter (mm)	Height (mm)	Weight (g)	
CR2032W	3	210	<1	20.0	3.2	3.1	-40 to 125
CR2050W	3	345	<1	20.0	5.0	4.2	-40 to 125
CR2450W	3	550	<1	24.5	5.0	6.7	-40 to 125
CR2477W	3	1000	<1	24.5	7.7	10.3	-40 to 125

Nominal capacity indicates duration until discharge voltage drops down to 2.0V when discharged at nominal discharge current at 23°C.
Data is not guaranteed, and is provided for reference purposes only.
For special sizes or specifications not included in the above list, please consult a sales representative.

Continued on the following page. ↗

Tab-welder

Mounting Direction	Tab Specification				Model Name					
	Shape	Width of Negative Tab Tip (mm)	Width of Positive Tab Tip (mm)	Pitch (mm)	CR2032	CR2430	CR2450	CR2477	CR2050W	CR2450W
H 	E	0.75	0.75X2	17.8	CR2032-HE8 	CR2430-HE1 	CR2450-HE5 	CR2477-HE1 		
		0.75	0.75X2	20.5	CR2032-HE1 	CR2430-HE2 	CR2450-HE6 	CR2477-HE2 		
	O	1.8	2.8	20.5	CR2032-HO6 	CR2430-HO1 	CR2450-HO5 	CR2477-HO4 		
V 	E	0.75	0.75X2	N/A	CR2032-VE3 	CR2430-VE1 	CR2450-VE6 	CR2477-VE1 		
M 	P	2.0	2.0	N/A					CR2050W-MP1 	CR2450W-MP1 

For tab shapes or specifications not included in the above list, please consult a sales representative.

Silver Oxide Batteries

Silver oxide batteries are small-sized primary batteries with high capacity and stable discharge characteristics. They are suitable for quartz watches, medical devices and precision instruments. All models are 100% made in Japan, and environmentally friendly (0% mercury).

Model	Electrical Characteristics		Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Diameter (mm)	Height (mm)	Weight (g)	
SR621	1.55	20	6.8	2.15	0.31	-10 to 60
SR626	1.55	28	6.8	2.60	0.39	-10 to 60
SR721	1.55	29	7.9	2.10	0.41	-10 to 60
SR726	1.55	35	7.9	2.60	0.48	-10 to 60
SR41	1.55	45	7.9	3.60	0.65	-10 to 60
SR48	1.55	75	7.9	5.40	1.10	-10 to 60
SR920	1.55	40	9.5	2.05	0.58	-10 to 60
SR927	1.55	60	9.5	2.70	0.76	-10 to 60
SR936	1.55	75	9.5	3.60	1.01	-10 to 60
SR1120	1.55	60	11.6	2.05	0.92	-10 to 60
SR1130	1.55	85	11.6	3.05	1.33	-10 to 60
SR43	1.55	110	11.6	4.20	1.73	-10 to 60
SR44	1.55	160	11.6	5.40	2.17	-10 to 60

Data is not guaranteed, and is provided for reference purposes only.
Please contact us for other models.

Alkaline Manganese Batteries

Alkaline manganese batteries are small-sized primary batteries with high performance. They are suitable for various applications such as toys, medical devices and health appliances. All models are 100% made in Japan, and environmentally friendly (0% mercury).

Model	Electrical Characteristics		Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Diameter (mm)	Height (mm)	Weight (g)	
LR41	1.5	45	7.9	3.60	0.6	-10 to 60
LR1130	1.5	70	11.6	3.05	1.2	-10 to 60
LR43	1.5	110	11.6	4.20	1.5	-10 to 60
LR44	1.5	120	11.6	5.40	2.0	-10 to 60

Data is not guaranteed, and is provided for reference purposes only.
Please contact us for other models.

Sound Components (Buzzer)

Piezoelectric ceramic materials that expand and shrink by applying voltage are used in piezoelectric sound components.

Summary

Using Murata's unique ceramic material, we offer a variety of piezoelectric sound components.

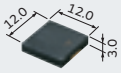
Lineup

- SMD Piezoelectric Sounders
- Pin Type Piezoelectric Sounders
- Piezoelectric Buzzers
- Piezoelectric Diaphragms

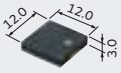
SMD Piezoelectric Sounders

Low power consumption, lightweight.
Optimized for small devices such as blood glucose meters, clinical thermometers, photoflashes for cameras, and portable terminals.
Applicable for automotive usage based on our design and manufacturing technology.

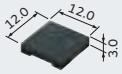
PKMCS1818E20



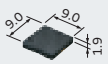
PKLCS1212E20



PKLCS1212E24



PKLCS1212E40



PKMCS0909E40

(in mm)

Applications	Mounting Type	Drive Type	Main Part Number	Sound Pressure Level (typ.)	Measurement Condition of Sound Pressure Level
For Automotive	Surface Mounting Type	External Drive	PKMCS1818E20A0-R1	100dB	12Vo-p, 2.0kHz, square wave, 10cm
			PKLCS1212E20A0-R1	76dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKLCS1212E24A0-R1	80dB	±1.5Vo-p, 2.4kHz, square wave, 10cm
			PKLCS1212E40A1-R1	84dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
For Consumer			PKLCS1212E2000-R1	76dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKLCS1212E2400-R1	80dB	±1.5Vo-p, 2.4kHz, square wave, 10cm
			PKLCS1212E4001-R1	84dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
			PKMCS0909E4000-R1	72dB	±1.5Vo-p, 4.0kHz, square wave, 10cm

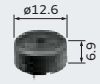
Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

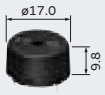
▪ Piezoelectric Sound Components Cat. No. P37E

Pin Type Piezoelectric Sounders

Low power consumption, lightweight.
These products are optimized for operation confirmation sounds and warning sounds in household appliances such as air conditioners, washers, and refrigerators.

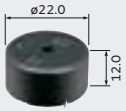


PKM13EPYH

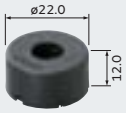


PKM17EPP

PKM22EPH



PKM22EPPH20



PKM22EPPH40

(in mm)

Packaging	Mounting Type	Drive Type	Main Part Number	Sound Pressure Level (typ.)	Measurement Condition of Sound Pressure Level
Taping	Pin Type	External Drive	**PKM13EPYH4000-A0**	78dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
Bulk			**PKM13EPYH4002-B0**	78dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
			PKM17EPP-2002-B0	79dB	3.0Vo-p, 2.0kHz, square wave, 10cm
			PKM22EPH2001	85dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKM22EPPH2001-B0	79dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKM22EPPH4007-B0	92dB	±1.5Vo-p, 4.0kHz, square wave, 10cm

Piezoelectric Buzzers

This is a unified piezoelectric sounder connected to a built-in self-drive circuit, and it easily generates sound with only a DC power supply.
Suitable for gas detector alarms/burglar alarms/home-electronic appliances.

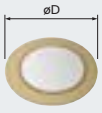
PKB24SPCH

(in mm)

Mounting Type	Drive Type	Main Part Number	Sound Pressure Level (min.)	Measurement Condition of Sound Pressure Level
Pin Type	Self Drive	**PKB24SPCH3601-B0**	90dB	12Vdc, 10cm

Piezoelectric Diaphragms

Low power consumption, lightweight.
Suitable for clocks/calculators/digital cameras/burglar alarms, and various alarms.



7BB-□□-□

Drive Type	Main Part Number	Plate Size (øD)
External Drive	**7BB-12-9**	ø12.0mm
	7BB-15-6	ø15.0mm
	7BB-20-6	ø20.0mm
	7BB-27-4	ø27.0mm

□: Indicates Metal Plate Diameter and Resonant Frequency Type.

Others

Wireless Communication Modules

Available for a wide range of applications such as automotive, mobile computing devices, and household appliances.

Wi-Fi Modules/ Bluetooth · Wi-Fi Combo Modules

Features
Compact, highly efficient, and flexible custom-made correspondence

Applications
Mobile phones, automotive, tablet PC, POS, HT, electric equipment, smart grid, etc.

Bluetooth Modules/ Bluetooth Low Energy Modules

Features
Compact, highly efficient, and flexible custom-made correspondence

Applications
Mobile phones, automotive, PMP, POS, HT, healthcare, wireless remote control, etc.

Low Power Wide Area Network (LPWAN) Wireless Module

Features
LPWA Wireless Technology-Low-Power consumption, wide area coverage, enables IoT applications. Compact, high efficient, support various communication standards.

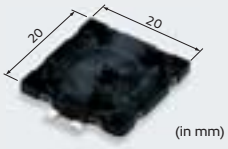
Applications
Positioning Tracking, Smart Houses, Agriculture, Healthcare/Medical, Industrial, Logistics, Utilities (Water, Gas Metering), etc.

Micromechatronics

Utilizing the vibration and deformation properties of piezoelectric materials.

Microblowers

Tiny air pumps without a motor



Features

Microblowers are designed to function as an air pump,
using the ultrasonic vibrations of piezoelectric ceramics,
which can generate high pressure air from a thin and extremely compact unit.

Applications

Aroma/diffuser, gas & alcohol sensor, air ionizer, amusement, etc.

Part Number	Size	Air Flow	Static Pressure	Voltage of Operation
MZB1001T02	20(W)X20(L)X1.85(H)mm without the nozzle	≧0.7L/min@15Vp-p	≧1.42kPa@15Vp-p	10 to 20Vp-p

For more details on Microblowers, please refer to our website.

Others

Ceramic Applied Products

Contribution to high integration and miniaturization requirements of the automotive industry and RF modules.

Low Temperature Co-fired Ceramics (LTCC) Multi-layer Module Boards

LTCC, Low Temperature Co-fired Ceramics, is a multi-layer, glass ceramic substrate that is co-fired with low resistance metal conductors. What makes Murata's LTCC special is our unique "Zero Shrinking Sintering Process," which restricts the ceramic shrinkage to only thickness.
Murata's LTCC multilayer substrates LFC are useful in a wide range of electronic equipment such as substrates for highly reliable electronic control units equipping vehicles and functional substrates for miniaturized high-frequency modules in cellular phones.

LFC Series

Murata's LFC Series LTCC substrate meets high integration and miniaturization requirements necessary for automotive applications.

AWG Series

Utilized in low-profile, small outline RF modules, the AWG Series features ultra-thin ceramic tapes, multiple material tape lamination, and enhanced board strength.

Cat.No. N20E

Others

Variable Capacitors

Capacitance value can be adjusted by the tuning voltage.

LXRW_V Series

LXRW0YV Series

LXRW19V Series

(in mm)

Thin film variable capacitors can carry out the variable of the capacitor by adjusting the tuning voltage.
It is designed for use as frequency matching for HF band (13.56MHz).

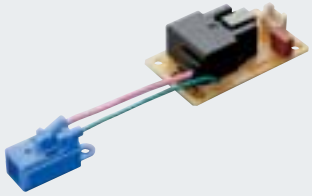
Ionizer Modules Ionissimo®

High-concentration ion, compact design, ozone control

Ionissimo® is an ionizer module with unprecedented compactness and high efficiency, capable of generating the largest number of ions in the industry* owing to Murata's own high-voltage technology and structural design. The ion generator is connected to the driving power supply for modularization and ease of incorporating into equipment.

*Surveyed by Murata (as of March 2011)

MHM Series



Features

· A large number of ions will be created by the original structure.
· Compact equipment may be designed due to small ionizer element and driving power supply.
· Ozone amounts may be optimized for specific applications by controlling the generation of ozone without changing the number of ions.

Applications

Air conditioner, air purifier, static eliminator, vacuum cleaner, etc.

Items	MHM314 Type	MHM305 Type	MHM306 Type	MHM400 Type
Input Voltage (VDC)	+10.8 to 13.2	←	←	←
Power	0.9W	0.4W	0.6W	0.6W
Ion Polarity	Negative	←	←	Positive
Ion Amount (*1)	>20000000pcs/cc (*2)	>20000000pcs/cc	←	←
Ozone Level	0.1mg/H (typ.)	<0.1mg/H	<1.0mg/H	<0.1mg/H
Operating Temp.	-10 to 50°C	←	←	←
Operating Humidity	20 to 80%RH (without dewdrop)	←	←	←

(*1) Measuring distance : 20cm
(*2) MHM314's Ion amount is around 3 times compare with MHM305.

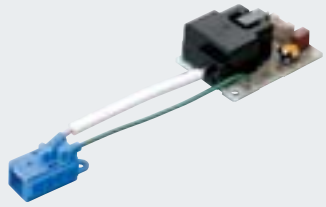
View a demonstration video of Ionizer Modules Ionissimo® on our website.

Others

Ozonizer Modules Ionissimo®

By using low temperature co-fired ceramic substrate (LTCC) for the discharger ozone will be generated stably.

MHM Series



Features

· Stable ozone generation.
· MHM501 type can be used under high humidity conditions.
· Small size

Applications

Refrigerator, vacuum cleaner, dishwasher, clothes washer, etc.

Items	MHM500 Type	MHM501 Type	MHM502 Type
Input Voltage (VDC)	+11 to 13	←	←
Power	1.0W	1.0W (with heater)	6.0W
Ozone Level	<2.5mg/H	<2.5mg/H	<60mg/H
Operating Temp.	-10 to 50℃	←	←
Operating Humidity	20 to 80%RH (without dewdrop)	20 to 95%RH	20 to 85%RH (without dewdrop)

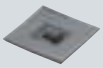
View a demonstration video of Ozonizer Modules Ionissimo® on our website.

Others

RFID Devices

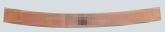
RFID for transferring identification data by wireless communication. The state-of-the-art technology allows IC tags to be attached to places where traditional barcode and QR code technology could suffer from aging. Murata offers a comprehensive range of items required to introduce RFID, from IC tags to high-quality antennas, reader/writers, and software applications. With the complete kits from Murata, RFID is seamlessly and reliably implemented.

HF (13.56 MHz) RFID Tag (MAGICSTRAP®)

Part number	LXMS33HCNG-134	LXMS33HCNK-171	LXMS33HCNL-167	LXTBDVHCNK-004	LXMSAPHA08-136	LXMSAPHA17-176
Type	Embeddable (Antenna integrated)				Tag (Antenna combined)	
Appearance						
RFID Standard	ISO15693 NFC Forum type5	ISO14443 TypeA NFC Forum type2		ISO14443 TypeA NFC Forum type2	ISO15693 NFC Forum type5	ISO14443 TypeA NFC Forum type2
Frequency	13.56MHz					
IC	NXP ICODE SLIX	NXP NTAG210	NXP NTAG212	NXP NTAG210	NXP ICODE SLIX	NXP NTAG213
UID memory	64bit					
NDEF memory	896bit	384bit	1024bit	384bit	896bit	1152bit
Size (L x W x H)	3.2 x 3.2 x 0.7 mm	3.2 x 3.2 x 0.75 mm		5.5 x 8.0 x 2.5 mm	8.3 x 8.3 x 0.8 mm	
Read range (typ)	20mm (200mW reader)	15mm (200mW reader)	15mm (200mW reader)	24mm (200mW reader)	42mm (200mW reader)	32mm (200mW reader)

*Read range depends on the performance of the output power and the antenna of reader writer.

UHF (860/920MHz) RFID Tag (MAGICSTRAP®)

Part number	LXMS21NCNH-147	LXMSJZNCMF-198	LXMS21ACMF-183	LXMS21ACNP-184	LXMSANAA19-181	LXMSANAA18-182
Type	Embeddable (Antenna integrated)		PCB mount (External antenna)		Laundry tag (Antenna combined)	
Appearance						
RFID Standard	ISO18000-63 and EPC Global Gen2(v1.2.0)	ISO18000-63 and EPC Global Gen2v2	ISO18000-63 and EPC Global Gen2v2	ISO18000-63 and EPC Global Gen2(v1.2.0)	ISO18000-63 and EPC Global Gen2v2	
Frequency	865-928MHz				902-928MHz	865-868MHz
IC	NXP G2iM	Impinj Monza R6	Impinj Monza R6	NXP UCODE 7xm	Impinj Monza R6	
EPC memory	256bit	96bit	96bit	448bit	96bit	
User memory	512bit	NA	NA	2048bit	NA	
Size (L x W x H)	2.0 x 1.25 x 0.55 mm	1.25 x 1.25 x 0.55 mm	2.0 x 1.25 x 0.5 mm		40 x 6 x 0.9 mm	
Read range (typ)	10mm (500mW reader)	10mm (500mW reader)	9m (4W EIRP)	7m (4W EIRP)	2m (4W EIRP)	2m (4W EIRP)

* Read range depends on the performance of the output power and the antenna of reader writer.

Note: MAGICSTRAP® is a registered trademark of Murata Manufacturing Co., Ltd.
Note: monza is a registered trademark of USA-based Impinj, Inc. in the United States and/or in other countries.
Note: ICODE and UCODE are registered trademarks of USA-based NXP Semiconductors N.V. in the United States and/or in other countries.

Femtet - CAE Software

Murata Software

Multifunction

- Perform simulation in up to 7 physical domains
- Coupled analyses for multiphysics

Simple Operation

User-friendly GUI and automated Mesher

All-in-one CAE software available: $4,999.^{00*}$

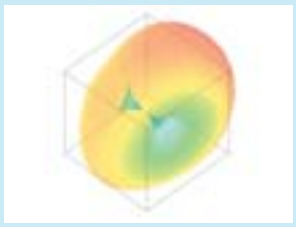
* License price per user for one year

Mechanical Stress

Drop impact

Smartphone

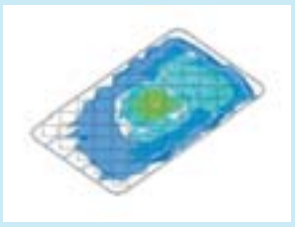
Electromagnetic Field



3D Directivity

Antenna

Electric Field



Electric field

Touch Panel

Acoustic Waves

Sound pressure

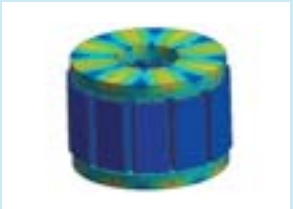
Ultrasonic Sensor

Thermal Conductivity

Temperature

Board

Magnetic Field



Magnetic flux

Axial-Gap Motor

Piezo Electricity

Displacement

Piezoelectric Motor

Free Trial

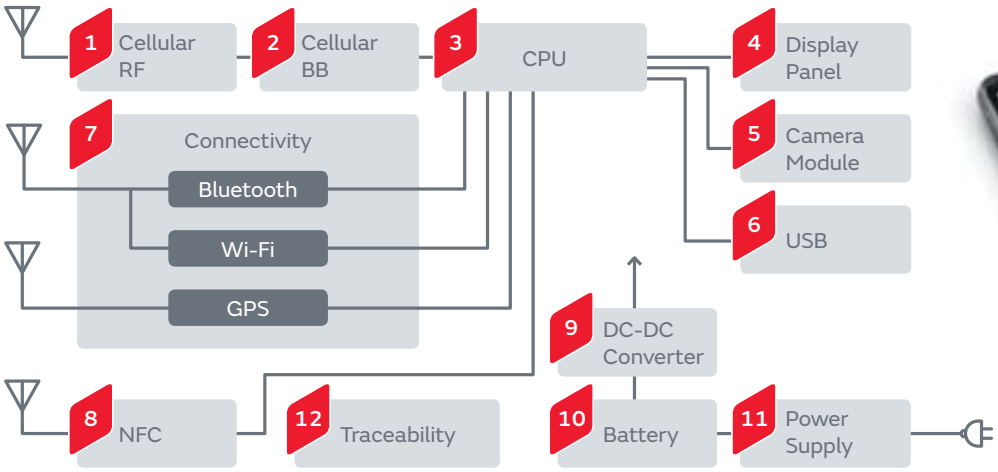
Apply for a free 60-day trial: **http://www.muratasoftware.com/en/**

Application Guides

muRata

K70E.pdf
Jan.16,2018

Smart Phones



1 Cellular RF

SAW Duplexers
SAY Series

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Dividers
LDD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

High-Frequency Matching Transformers
SMST Series

Microwave Coaxial Cable Connectors
Microwave Coaxial Connectors with Switch

Multi Line Connectors

Chip Inductors (Chip Coils)
LQW/LQP Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

2 Cellular BB

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP Series

Thermistors
NCP/PRF Series

3 CPU

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
NCP/PRF Series

4 Display Panel

Ceramic Resonators CERALOCK®
CST Series

EMI Suppression Filters EMIFIL®
NFA Series

ESD Protection Devices
LXES Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP Series

Thermistors
NCP/PRF Series

5 Camera Module

Chip Multilayer Ceramic Capacitors for Camera Flash Circuit Only
GR7 Series

Supercapacitors (EDLC)
DMF/DMT Series

Chip Ferrite Beads
BLM Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC

6 USB

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

Chip Ferrite Beads
BLM Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

7 Connectivity

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Bluetooth Modules

Wi-Fi Modules

Bluetooth - Wi-Fi Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Microwave Coaxial Cable Connectors
Microwave Coaxial Connectors with Switch

Multi Line Connectors

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

Crystal Units
XRC Series

8 NFC

NFC Antennas
FLAN Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

Variable Capacitors
LXRW Series

ESD Protection Devices
LXES Series

9 DC-DC Converter

Chip Multilayer Ceramic Capacitors
on Interposer Board for General Purpose
ZRB Series

Metal Terminal Type Multilayer Ceramic Capacitors
for General Purpose
KRM Series

Polymer Aluminum
Electrolytic Capacitors
ECAS/ECNS Series

Thermistors
NCP/PRF Series

10 Battery

Thermistors
NCP/PRF/PRG Series

12 Traceability

RFID Tag Device
(MAGICSTRAP®)
LXMS Series

11 Power Supply

Chip Multilayer Ceramic Capacitors
for General Purpose
GR/GA Series

Safety Standard Certified Resin
Molding SMD Type Ceramic
Capacitors for General Purpose
DK1 Series

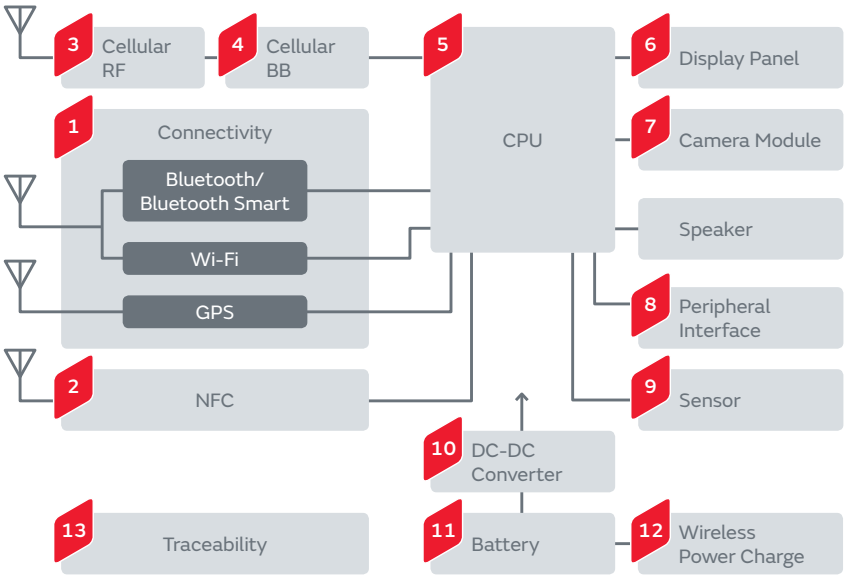
Safety Standard Certified Lead Type Disc
Ceramic Capacitors for General Purpose
DE1/DE2 Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Wearable Devices



1 Connectivity

Bluetooth Modules

Wi-Fi Modules

Bluetooth - Wi-Fi Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial Cable Connectors
Microwave Coaxial Connectors with Switch

Multi Line Connectors

Crystal Units
XRC Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

2 NFC

NFC Antennas
FLAN Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

Variable Capacitors
LXRW Series

ESD Protection Devices
LXES Series

3 Cellular RF

Chip Multilayer Diplexers
LFD Series

SAW Duplexers
SAY Series

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Dividers
LDD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

High-Frequency Matching Transformers
SMST Series

Microwave Coaxial Cable Connectors
Microwave Coaxial Connectors with Switch

Multi Line Connectors

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

4 Cellular BB

Thermistors
NCP/PRF Series

5 CPU

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

6 Display Panel

- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

7 Camera Module

- Chip Multilayer Ceramic Capacitors for Camera Flash Circuit Only GR7 Series
- Supercapacitors (EDLC) DMF/DMT Series
- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

8 Peripheral Interface

- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Chip Common Mode Choke Coils/ Noise Filters DLW/DLP/NFP/DLM Series
- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

9 Sensor

- Pressure Sensors ZPA Series
- Thermistors NCP/PRF Series

10 DC-DC Converter

- Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose ZRB Series
- Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series
- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Thermistors NCP Series

11 Battery

- Thermistors NCP/PRF/PRG Series
- Coin Manganese Dioxide Lithium Batteries Standard Type

12 Wireless Power Charge

- LW Reversed Low ESL Chip Multilayer Ceramic Capacitors for General Purpose LLL Series
- Thermistors NCP/PRF Series

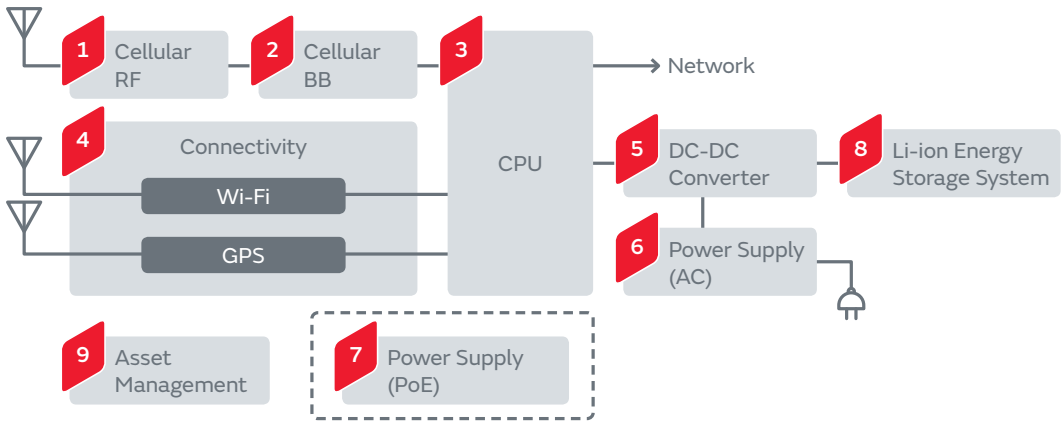
13 Traceability

- RFID Tag Device (MAGICSTRAP®) LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Supercapacitors (EDLC)	DMF/DMT/DMH Series	Power Line/Battery Peak Assist
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Small Energy Devices	UMAC/UMAL Series	Battery Backup
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component

Base Stations



1 Cellular RF

Chip Multilayer Diplexers
LFD Series

Dielectric Filters GIGAFIL®
TDF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

ESD Protection Devices
LXES Series

Thermistors
PRF Series

2 Cellular BB

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP Series

Thermistors
PRF Series

3 CPU

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
PRF Series

4 Connectivity

Wi-Fi Modules

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

ESD Protection Devices
LXES Series

Thermistors
PRF Series

Crystal Units
XRC Series

5 DC-DC Converter

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Thermistors
PRF Series

6 Power Supply (AC)

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

7 Power Supply (PoE)

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

8 Li-ion Energy Storage System

Energy Storage Module Model
IJ1101M Series

BMU (Battery Management Unit)
IJ8101C Series

BMU-HUB
IJ1101K Series

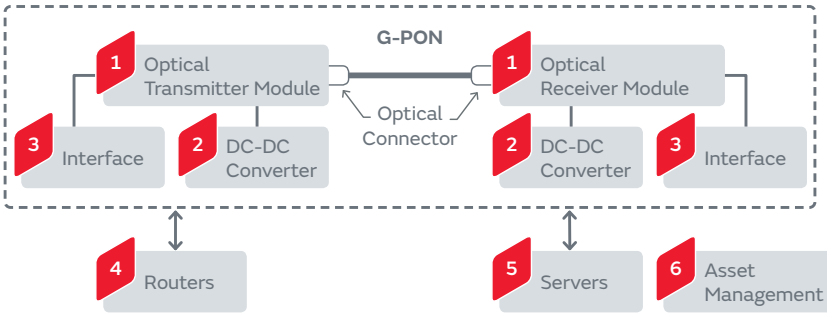
9 Asset Management

RFID Tag Device (MAGICSTRAP®)
LXFL Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type/Heat-resistant Type	Battery Backup	

G-PON



1 Optical Transmitter Module/Optical Receiver Module

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose
GMA Series

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose
GMD Series

Single Layer Microchip Capacitors
CLB Series

Thin Film Circuit Substrate RUSUB®
RUCYT Series

2 DC-DC Converter

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Thermistors
PRF Series

3 Interface

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

4 Routers

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose
GMA Series

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose
GMD Series

Crystal Units
XRC Series

Supercapacitors (EDLC)
DMT Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP Series

5 Servers

Supercapacitors (EDLC)
DMT Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

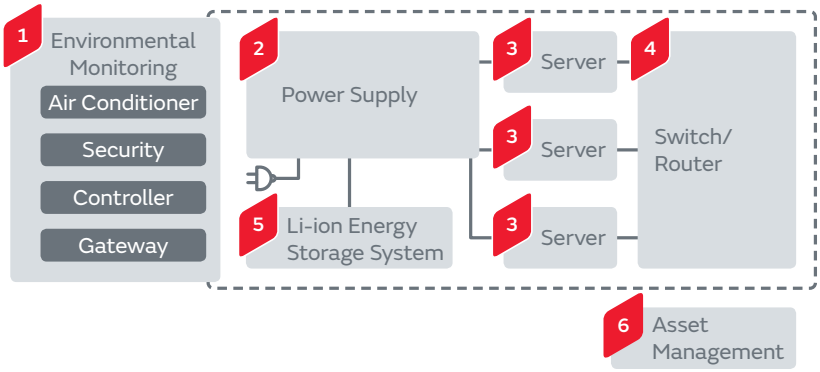
6 Asset Management

RFID Tag Device (MAGICSTRAP®)
LXFL Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type/Heat-resistant Type	Battery Backup	

Data Center



1 Environmental Monitoring

Wi-Fi Modules

Sub-GHz Modules

Magnetic Sensors (AMR Sensors) MR Series

Pressure Sensors ZPA Series

Thermistors NCU Series

2 Power Supply

3-phase PFC Converters MPA Series

DC-DC Converters for High Voltage Direct Current (HVDC) MPA Series

3 Server

Isolated DC-DC Converters MYB Series

Non-Isolated DC-DC Converters MYMGK/OKL Series

Supercapacitors (EDLC) DMT Series

Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series

Crystal Units XRC Series

4 Switch/Router

Isolated DC-DC Converters MYB Series

Non-Isolated DC-DC Converters MYMGK/OKL Series

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose LLL/LLA/LLM Series

Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose GMA Series

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose GMD Series

Chip Common Mode Choke Coils/ Noise Filters DLW/DLP/NFP Series

Supercapacitors (EDLC) DMT Series

Crystal Units XRC Series

5 Li-ion Energy Storage System

Energy Storage Module Model IJ1101M Series

BMU (Battery Management Unit) IJ8101C Series

BMU-HUB IJ1101K Series

6 Asset Management

RFID Tag Device (MAGICSTRAP®) LXFL Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type/Heat-resistant Type	Battery Backup	

Automotive

Powertrain/Safety

1. ECU
2. AT
3. Auxilliary Motors
4. TPMS
5. ABS/ESC
6. Headlamp
7. EPS
8. Fuel Injection System

1 ECU

- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC
- Metal Terminal Type Multilayer Ceramic Capacitors for Automotive — KCM Series
- Chip Multilayer Ceramic Capacitors for Automotive — GCM Series
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive — GCJ Series
- AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive — GCG Series
- Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive — GCB Series
- 150°C/175°C/200°C Operation Leaded MLCC for Automotive — RH Series
- Ceramic Resonators CERALOCK® — CST Series
- Crystal Units — XRC Series
- Accelerometers — SCA Series
- Gyro Sensors — SCC Series
- Thermistors — PRF/PTG/NCU Series
- High Reliability Chip Ferrite Beads — BLM_SH1/BH1/TH1/JH1 Series
- High Reliability Common Mode Choke Coils — DLW31SH/DLW32SH/DLW43SH/DLW43MH Series

2 AT

- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC
- Metal Terminal Type Multilayer Ceramic Capacitors for Automotive — KCM Series
- Ceramic Resonators CERALOCK® — CST Series
- Crystal Units — XRC Series
- Accelerometers — SCA Series
- Thermistors — PRF/PTG/NCU Series
- High Reliability Chip Ferrite Beads — BLM_SH1/BH1/TH1/JH1 Series

3 Auxiliary Motors

- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC
- DC-DC Converters — MYIS Series
- Metal Terminal Type Multilayer Ceramic Capacitors for Automotive — KCM Series
- 150°C/175°C/200°C Operation Leaded MLCC for Automotive — RH Series
- Ceramic Resonators CERALOCK® — CST Series
- Large-current Common Mode Choke Coils — PLT10HH/BLT5BP Series
- Thermistors — PRF/PTG/NCU Series
- Crystal Units — XRC Series
- High Reliability Chip Ferrite Beads — BLM_SH1/BH1/TH1/JH1 Series

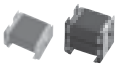
4 TPMS

- Shock Sensors — PKGS Series
- Ceramic Filters CERAFIL® — SFECF Series
- Ceramic Resonators CERALOCK® — CST Series
- Crystal Units — XRC Series
- Pressure Sensor Elements — SCB10H Series
- Thermistors — PRF/NCU Series
- Transponder Coils — SA3M08 Series
- Coin Manganese Dioxide Lithium Batteries — Heat-resistant Type
- High Reliability Chip Ferrite Beads — BLM_SH1/BH1/TH1/JH1 Series
- High Reliability Chip Inductors — LQG15HH Series

5 ABS/ESC

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Accelerometers
SCA Series

Gyro Sensors
SCC Series

Thermistors
NCG18/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

6 Headlamp

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC

Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

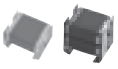
Thermistors
NCG18/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

7 EPS

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Leaded MLCC for Automotive
RCE Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
NCG18/NCU Series

Accelerometers
SCA Series

Gyro Sensors
SCC Series

Thermistors
PRF/PTG/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

8 Fuel Injection System

Leaded MLCC for Automotive
RCF Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

General Purpose (High Reliability)

Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°c
Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°c
150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°c 175°c 200°c
Chip Inductors (Chip Coils)	LQH32CH/MDH/DFEH Series	Voltage Conversion	85°c 150°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH Series	Common Mode Noise Suppression	125°c

85°c 85°c max. 125°c 125°c max. 150°c 150°c max. 175°c 175°c max. 200°c 200°c max.

HEV/PHEV/EV

1 Charger
2 BMS
3 Electrically-Driven Compressor
4 Electric Pump
5 Inverter
6 DC-DC Converter

1 Charger

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series

Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive
DE6 Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

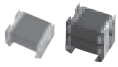
Large-current Common Mode Choke Coils
PLT10HH/BLT5BP Series

Thermistors
PRF/PTG/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

2 BMS

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Ceramic Resonators CERALOCK®
CST Series

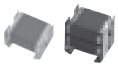
Crystal Units
XRC Series

Thermistors
PRF/PTG/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

3 Electrically-Driven Compressor

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Thermistors
PRF/PTG/NCU Series

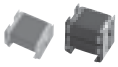
Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

4 Electric Pump

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC

Large-current Common Mode Choke Coils
PLT10HH/BLT5BP Series

Thermistors
PRF/PTG/NCU Series

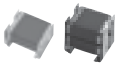
Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

5 Inverter

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

150°C/175°C/200°C Operation Leaded MLCC for Automotive
RH Series

Large-current Common Mode Choke Coils
PLT10HH/BLT5BP Series

Thermistors
PRF/PTG/NCU Series

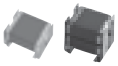
Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

6 DC-DC Converter

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Large-current Common Mode Choke Coils
PLT10HH/BLT5BP Series

Thermistors
PRF/PTG/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

General Purpose

AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infortainment	GRT Series	Coupling/Decoupling	
Ni Plating + Pd Plating termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	
Chip Inductors (Chip Coils)	LQW Series	Matching/High Frequency Choke	
Chip Inductors (Chip Coils)	LQM/LQH/DEF Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
EMI Suppression Filters EMIFIL®	NFL/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression	

General Purpose (High Reliability)

Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°c
Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°c
150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°c 175°c 200°c
Chip Inductors (Chip Coils)	LQH32CH/MDH/DFEH Series	Voltage Conversion	85°c 150°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH Series	Common Mode Noise Suppression	125°c

85°c 85°c max. 125°c 125°c max. 150°c 150°c max. 175°c 175°c max. 200°c 200°c max.

Information/Comfort/Accessory

1. Navigation/ Infotainment
2. Remote Keyless Entry
3. Meter/HUD
4. Power Seat/ Power Mirror
5. Parking Assist

1 Navigation/Infotainment

- Accelerometers SCA Series
- Supercapacitors (EDLC) DMF/DMT Series
- Ceramic Filters CERAFIL® SFECF Series
- Piezoelectric Sounders PKLCS/PKMCS Series
- Bluetooth Modules
- Wi-Fi Modules
- DC-DC Converters
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Thermistors PRF/PRG/PTG/NCU Series
- Chip Multilayer Diplexers LFD Series
- Chip Multilayer LC Filters LF Series
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Chip Multilayer Hybrid Couplers LDC/LDJ Series
- Chip Ferrite Beads BLM Series

2 Remote Keyless Entry

- Small Energy Devices UMAC/UMAL Series
- Supercapacitors (EDLC) DMF/DMT/DMH Series
- Ceramic Filters CERAFIL® SFECF Series
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Piezoelectric Sounders PKLCS/PKMCS Series
- Transponder Coils SA3D14/SA3D12/SA3M08/STA8121 Series
- Coin Manganese Dioxide Lithium Batteries Standard Type
- Chip Inductors (Chip Coils) LQW/LQP/LQG Series
- Chip Ferrite Beads BLM Series

3 Meter/HUD

- DC-DC Converters
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Piezoelectric Sounders PKM/PKLCS/PKMCS Series
- Thermistors PRF/PTG/NCU Series
- Chip Ferrite Beads BLM Series

4 Power Seat/Power Mirror

Piezoelectric Sounders
PKLCS/PKMCS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
PRF/PTG/NCU Series

Chip Ferrite Beads
BLM Series

5 Parking Assist

Ultrasonic Sensors
MA Series

Accelerometers
SCA Series

Supercapacitors (EDLC)
DMF/DMT Series

Piezoelectric Sounders
PKM/PKLCS/PKMCS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
PRF/PTG/NCU Series

Chip Ferrite Beads
BLM Series

General Purpose

AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infortainment	GRT Series	Coupling/Decoupling	
Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	
Chip Inductors (Chip Coils)	LQW Series	Matching/RF Choke	
Chip Inductors (Chip Coils)	LQM/LQH/DEF Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
EMI Suppression Filters EMIFIL®	NFL/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression	

General Purpose (High Reliability)

Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°c
Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°c
150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°c 175°c 200°c
Chip Inductors (Chip Coils)	LQH32CH/MDH/DFEH Series	Voltage Conversion	85°c 150°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH Series	Common Mode Noise Suppression	125°c

85°c 85°c max. 125°c 125°c max. 150°c 150°c max. 175°c 175°c max. 200°c 200°c max.

Bike/EV Bike

Electromotive

1. Charger/Battery
2. Inverter
3. DC-DC Converter

Electric Installation

4. Accelerometer for Fuel Cut
5. Headlamp
6. Fuel Injection System

1 Charger/Battery

- Lithium Ion Storage Modules
- Metal Terminal Type Multilayer Ceramic Capacitors for Automotive **KCM Series**
- Chip Multilayer Ceramic Capacitors for Automotive **GCM Series**
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive **GCJ Series**
- Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive **DE6 Series**
- Ceramic Resonators CERALOCK® **CST Series**
- Crystal Units **XRC Series**
- Large-current Common Mode Choke Coils **PLT10HH/BLT5BP Series**
- Thermistors **PRF/PTG/NCU Series**
- High Reliability Chip Ferrite Beads **BLM_SH1/BH1/TH1/JH1 Series**

2 Inverter

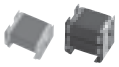
- Chip Multilayer Ceramic Capacitors for Automotive **GCM Series**
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive **GCJ Series**
- AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive **GCG Series**
- Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive **GCB Series**
- 150°C/175°C/200°C Operation Leaded MLCC for Automotive **RH Series**
- Large-current Common Mode Choke Coils **PLT10HH/BLT5BP Series**
- Thermistors **PRF/PTG/NCU Series**
- Ceramic Resonators CERALOCK® **CST Series**
- Crystal Units **XRC Series**
- High Reliability Chip Ferrite Beads **BLM_SH1/BH1/TH1/JH1 Series**

3 DC-DC Converter

- DC-DC Converters **MYPMA Series**
- Metal Terminal Type Multilayer Ceramic Capacitors for Automotive **KCM Series**
- Chip Multilayer Ceramic Capacitors for Automotive **GCM Series**
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive **GCJ Series**
- AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive **GCG Series**
- Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive **GCB Series**
- Ceramic Resonators CERALOCK® **CST Series**
- Crystal Units **XRC Series**
- Large-current Common Mode Choke Coils **PLT10HH/BLT5BP Series**
- Thermistors **PRF/PTG/NCU Series**
- High Reliability Chip Ferrite Beads **BLM_SH1/BH1/TH1/JH1 Series**

4 Accelerometer for Fuel Cut

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Accelerometers
SCA Series

Gyro Sensors
SCC Series

Thermistors
NCG18/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

5 Headlamp

Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

Ceramic Resonators CERALOCK®
CST Series

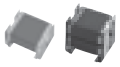
Crystal Units
XRC Series

Thermistors
NCG18/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

6 Fuel Injection System

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series



Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
PRF/PTG/NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

General Purpose

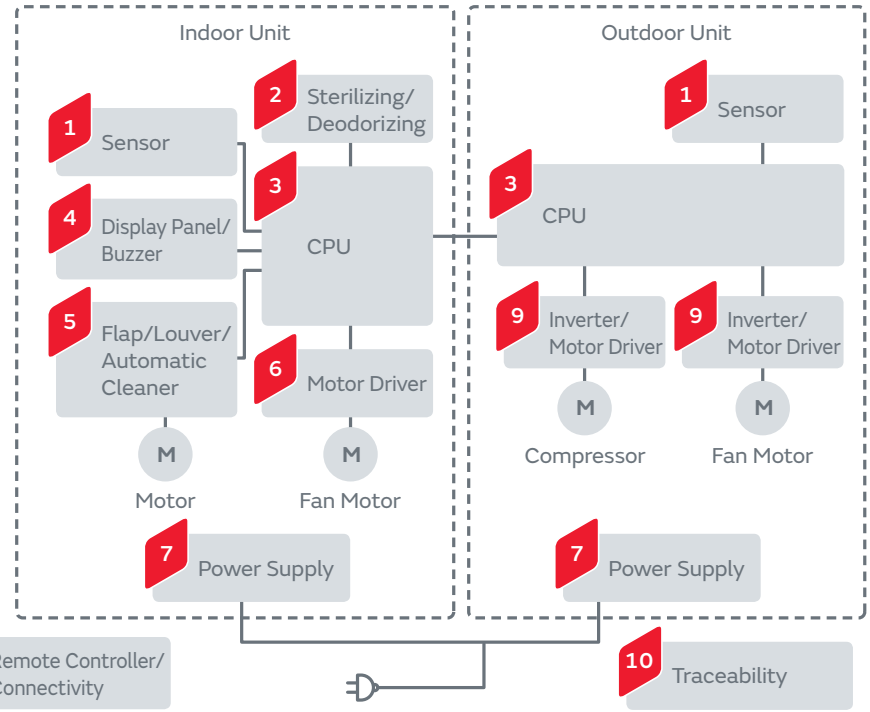
AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infortainment	GRT Series	Coupling/Decoupling	
Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	
Chip Inductors (Chip Coils)	LQW Series	Matching/High Frequency Choke	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
EMI Suppression Filters EMIFIL®	NFL/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression	

General Purpose (High Reliability)

Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°c
Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°c
150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°c 175°c 200°c
Chip Inductors (Chip Coils)	LQH32CH/MDH/DFEH Series	Voltage Conversion	85°c 150°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH Series	Common Mode Noise Suppression	125°c

85°c 85°c max. 125°c 125°c max. 150°c 150°c max. 175°c 175°c max. 200°c 200°c max.

Air Conditioner



1 Sensor

Pyroelectric Infrared Sensors
IRA Series

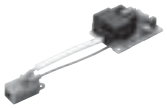
Ultrasonic Sensors
MA Series

Thermistors
NCP/NXR/PRF Series

2 Sterilizing/Deodorizing

Ionizer Modules Ionissimo®
MHM300 Series

Ozonizer Modules Ionissimo®
MHM500 Series



High Voltage Resistors
MHR Series

3 CPU

Ceramic Resonators CERALOCK®
CST Series

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

5 Flap/Louver/Automatic Cleaner

Rotary Position Sensors
SV Series

6 Motor Driver

Thermistors
NCP/NXR/PRF Series

7 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
PTG Series

8 Remote Controller/Connectivity

Bluetooth Modules

Wi-Fi Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Crystal Units
XRC Series

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

9 Inverter/Motor Driver

Ceramic Resonators CERALOCK®
CST Series

Thermistors
NCP/NXR/PRF Series

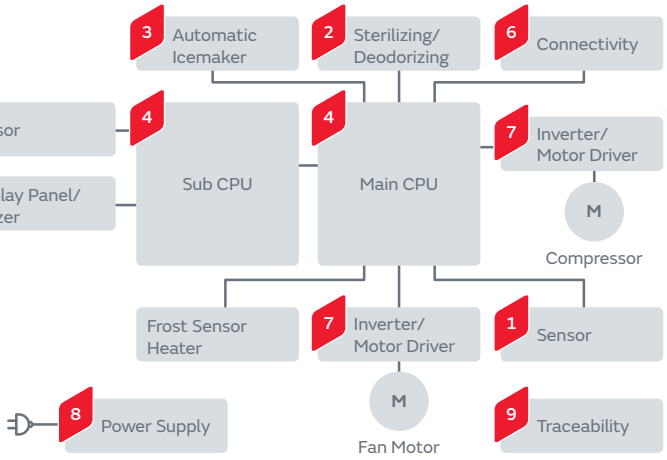
10 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Refrigerator



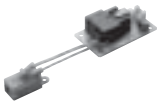
1 Sensor

Pyroelectric Infrared Sensors
IRA Series

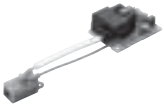
Thermistors
NCP/NXR/PRF Series

2 Sterilizing/Deodorizing

Ionizer Modules Ionissimo®
MHM300 Series

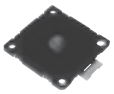


Ozonizer Modules Ionissimo®
MHM500 Series



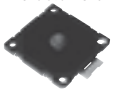
High Voltage Resistors
MHR Series

Microblowers



3 Automatic Icemaker

Microblowers



4 CPU

Ceramic Resonators CERALOCK®
CST Series

5 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

7 Inverter/Motor Driver

Thermistors
NCP/NXR/PRF Series

Ceramic Resonators CERALOCK®
CST Series

6 Connectivity

Bluetooth Modules

Wi-Fi Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Crystal Units
XRC Series

8 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
PTG Series

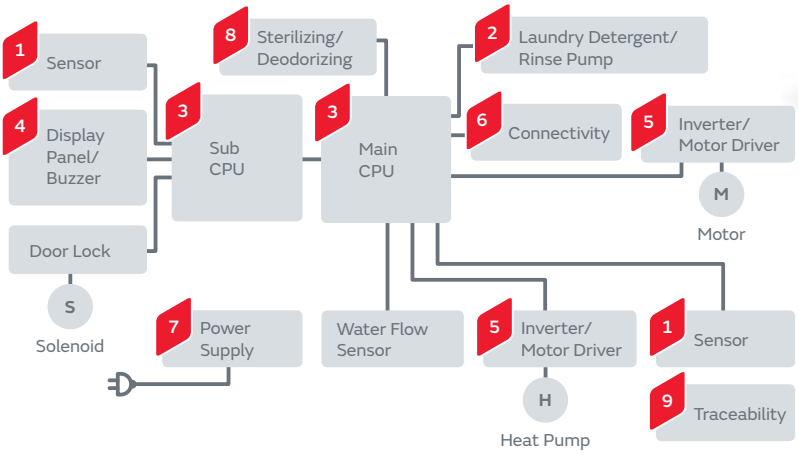
9 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Small Energy Devices	UMAC/UMAL Series	Battery Backup

Washing Machine

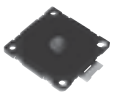


1 Sensor

Thermistors
NCP/NXR/PRF Series

2 Laundry Detergent/Rinse Pump

Microblowers



3 CPU

Ceramic Resonators
CERALOCK®
CST Series

4 Display Panel/Buzzer

Rotary Position Sensors
SV Series

Ceramic Resonators
CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

5 Inverter/Motor Driver

Thermistors
NCP/NXR/PRF Series

6 Connectivity

Bluetooth Modules

Wi-Fi Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Crystal Units
XRC Series

7 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
PTG Series

8 Sterilizing/Deodorizing

Ozonizer Modules
Ionissimo®
MHM500 Series

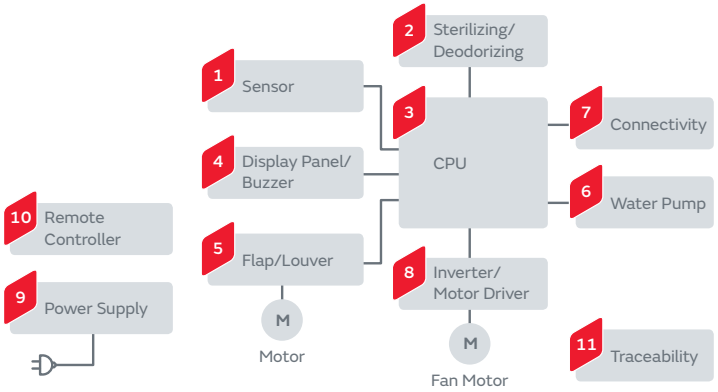
9 Traceability

RFID Tag Device
(MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup	

Air Purifier



1 Sensor

Pyroelectric Infrared Sensors
IRA Series

Ultrasonic Sensors
MA Series

Thermistors
NCP/NXR/PRF Series

2 Sterilizing/Deodorizing

Ionizer Modules Ionissimo®
MHM300 Series

Ozonizer Modules Ionissimo®
MHM500 Series

High Voltage Resistors
MHR Series

3 CPU

Ceramic Resonators CERALOCK®
CST Series

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

5 Flap/Louver

Rotary Position Sensors
SV Series

6 Water Pump

Microblowers

7 Connectivity

Bluetooth Modules

Wi-Fi Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Crystal Units
XRC Series

8 Inverter/Motor Driver

Thermistors
NCP/NXR/PRF Series

9 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Thermistors
PTG Series

10 Remote Controller

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

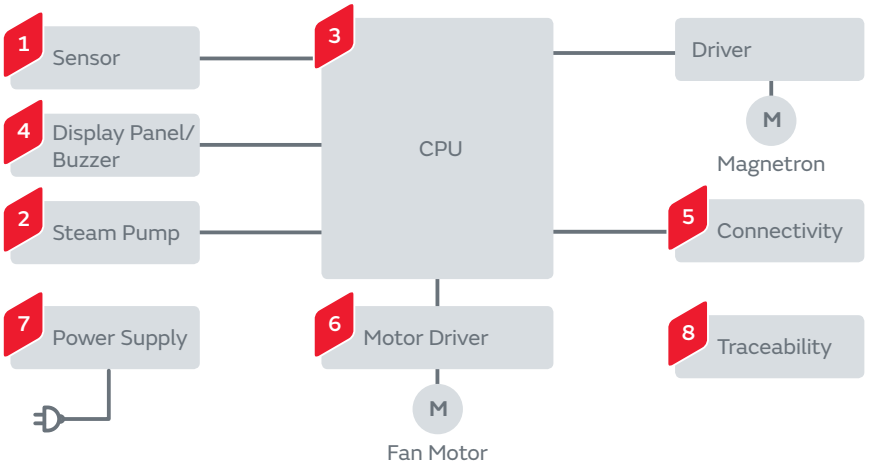
11 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup	

Microwave Oven

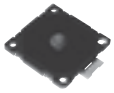


1 Sensor

Thermistors
NCP/NXR/PRF Series

2 Steam Pump

Microblowers



3 CPU

Ceramic Resonators CERALOCK®
CST Series

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

5 Connectivity

Bluetooth Modules

Wi-Fi Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Crystal Units
XRC Series

6 Motor Driver

Thermistors
NCP/NXR/PRF Series

7 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
PTG Series

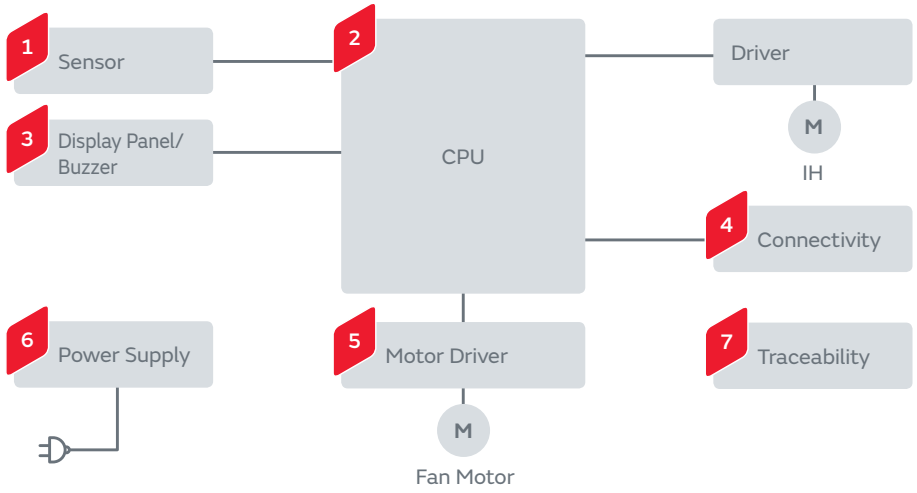
8 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

IH Rice Cooker



1 Sensor

Thermistors
NCP/NXR/PRF Series

2 CPU

Ceramic Resonators CERALOCK®
CST Series

5 Motor Driver

Thermistors
NCP/NXR/PRF Series

3 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

4 Connectivity

Bluetooth Modules

Wi-Fi Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Crystal Units
XRC Series

6 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
PTG Series

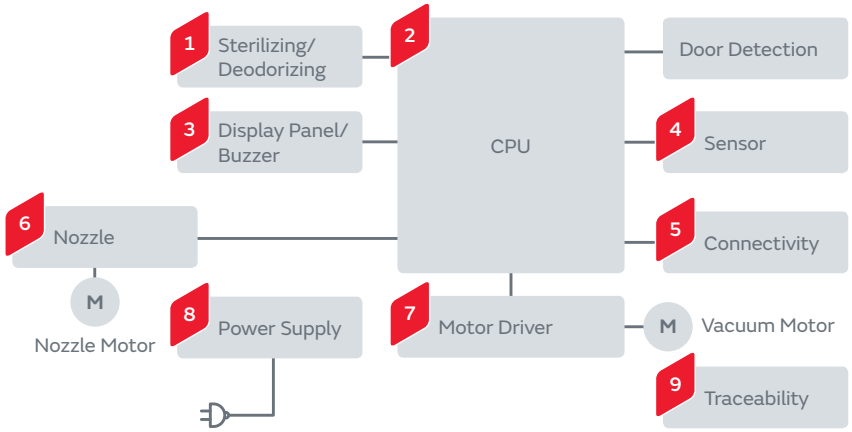
7 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

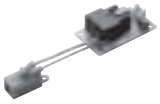
Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup	

Vacuum Cleaner



1 Sterilizing/Deodorizing

Ionizer Modules Ionissimo®
MHM300 Series



High Voltage Resistors
MHR Series

2 CPU

Ceramic Resonators CERALOCK®
CST Series

3 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

4 Sensor

Ultrasonic Sensors
MA Series

Thermistors
NCP Series

5 Connectivity

Bluetooth Modules

Wi-Fi Modules

Crystal Units
XRC Series

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

6 Nozzle

Thermistors
PTG Series

7 Motor Driver

Thermistors
NCP/NXP/PRF Series

8 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
PTG Series

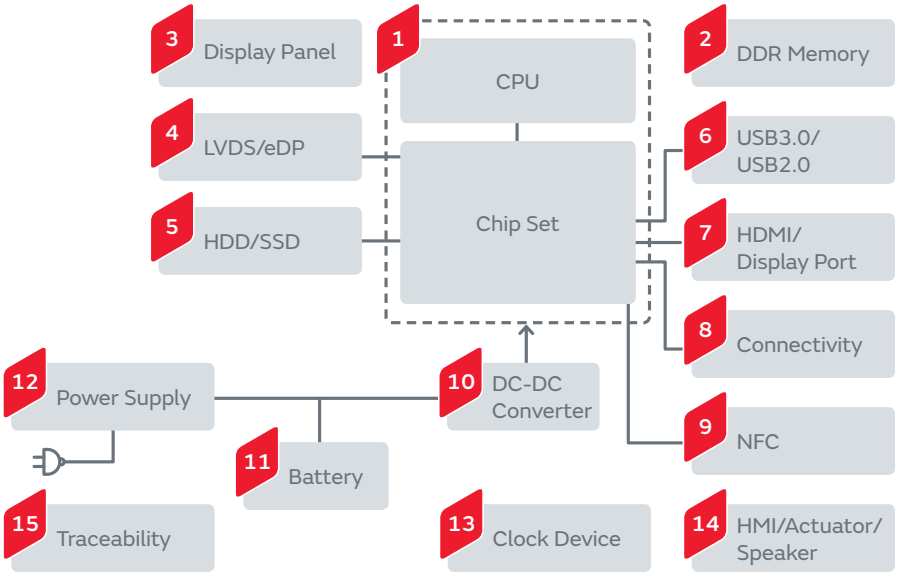
9 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Tablet Terminators



1 CPU/Chip Set

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
NCP/PRF Series

2 DDR Memory

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Chip Ferrite Beads
BLM Series

3 Display Panel

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Ceramic Resonators CERALOCK®
CST Series

Power Inductors
LQH Series

Thermistors
PRF/PRG Series

4 LVDS/eDP

Chip Common Mode Choke Coils/Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

5 HDD/SSD

Shock Sensors
PKGS Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Supercapacitors (EDLC)
DMT Series

Actuators

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

6 USB3.0/USB2.0

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils/Noise Filters
DLW/DLP/NFP/DLM Series

Chip Ferrite Beads
BLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

7 HDMI/Display Port

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

Crystal Units
XRC Series

8 Connectivity

Bluetooth Modules

Wi-Fi Modules

Bluetooth - Wi-Fi Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial Cable Connectors/Microwave Coaxial Connectors with Switch

Multi Line Connectors

Crystal Units
XRC Series

ESD Protection Devices
LXES Series

9 NFC

NFC Antennas
FLAN Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

Variable Capacitors
LXRW Series

ESD Protection Devices
LXES Series

10 DC-DC Converter

Thermistors
NCP/PRF Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

11 Battery

Ceramic Resonators CERALOCK®
CST Series

Thermistors
NXR/PRF/PRG Series

12 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK®
CST Series

Chip Common Mode Choke Coils
DLW44SM/DLW5A/DLW5B Series

Thermistors
NCP/PRF Series

13 Clock Device

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

14 HMI/Actuator/Speaker

ESD Protection Devices
LXES Series

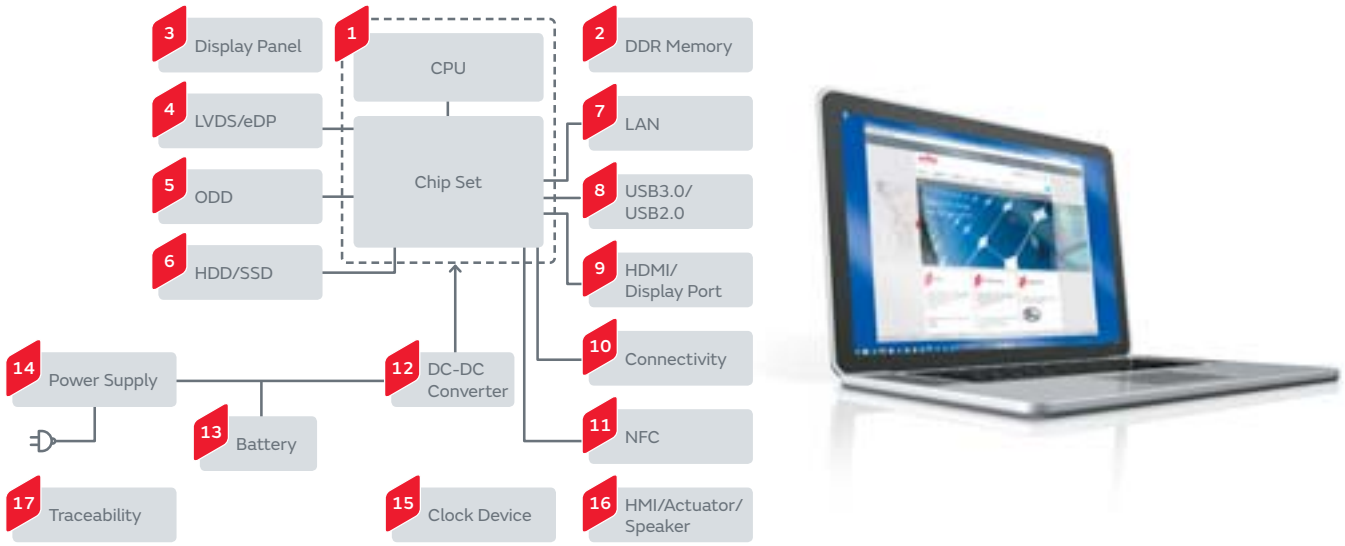
15 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Notebook Computers



1 CPU/Chip Set

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
NCP/PRF Series

2 DDR Memory

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Chip Ferrite Beads
BLM Series

3 Display Panel

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Ceramic Resonators CERALOCK®
CST Series

Power Inductors
LQH Series

Thermistors
PRF/PRG Series

4 LVDS/eDP

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

5 ODD

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
NCP Series

6 HDD/SSD

Shock Sensors
PKGS Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Supercapacitors (EDLC)
DMT Series

Actuators

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

7 LAN

Chip Multilayer Ceramic Capacitors for Ethernet LAN and Primary-secondary Coupling of DC-DC converters
GR4 Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

Crystal Units
XRC Series

8 USB3.0/USB2.0

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

9 HDMI/Display Port

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

Crystal Units
XRC Series

10 Connectivity

Bluetooth Modules

Wi-Fi Modules

Bluetooth - Wi-Fi Combo Modules

SAW Filters
SAF Series

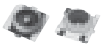
Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial Cable Connectors
Microwave Coaxial Connectors with Switch



Multi Line Connectors

ESD Protection Devices
LXES Series

Crystal Units
XRC Series

11 NFC

NFC Antennas
FLAN Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

Variable Capacitors
LXRW Series

ESD Protection Devices
LXES Series

12 DC-DC Converter

Thermistors
NCP/PRF Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

13 Battery

Ceramic Resonators CERALOCK®
CST Series

Thermistors
NXR/PRF/PRG Series

14 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK®
CST Series

Chip Common Mode Choke Coils
DLW44SM/DLW5A/DLW5B Series

Thermistors
NCP/PRF Series

15 Clock Device

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

16 HMI/Actuator/Speaker

ESD Protection Devices
LXES Series

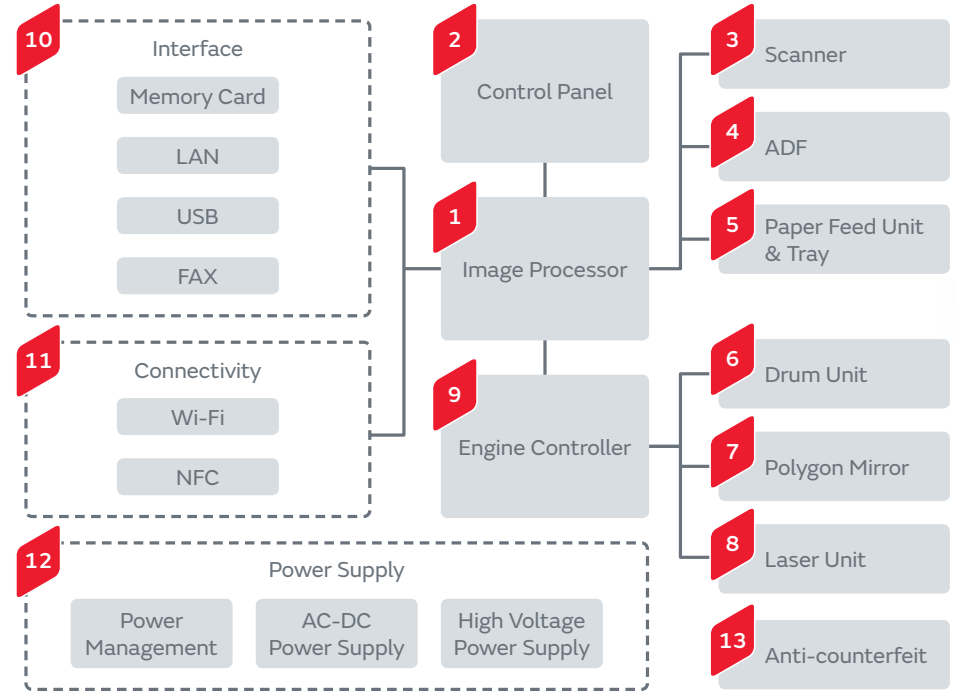
17 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup	

MFP (Multi Function Printer/Product/Peripheral)



1 Image Processor

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

2 Control Panel

Rotary Position Sensors
SV Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP Series

Thermistors
NCP/PRF Series

3 Scanner

Ultrasonic Sensors
MA Series

4 ADF

Ultrasonic Sensors
MA Series

Accelerometers
SCA Series

Rotary Position Sensors
SV Series

5 Paper Feed Unit & Tray

Magnetic Sensors (AMR Sensors)
MR Series

Rotary Position Sensors
SV Series

6 Drum Unit

Thermistors
NCP/PRF Series

7 Polygon Mirror

Accelerometers
SCA Series

8 Laser Unit

Thermistors
NCP/PRF Series

9 Engine Controller

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
PRF/PTG Series

10 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRF Series

11 Connectivity

Wi-Fi Modules

NFC Antennas
FLAN Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

ESD Protection Devices
LXES Series

12 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

High Voltage Resistors
MHR Series

Large-current Common Mode Choke Coils
PLT10HH/PLT5BPH/DLW5A/DLW5B/UCMH Series

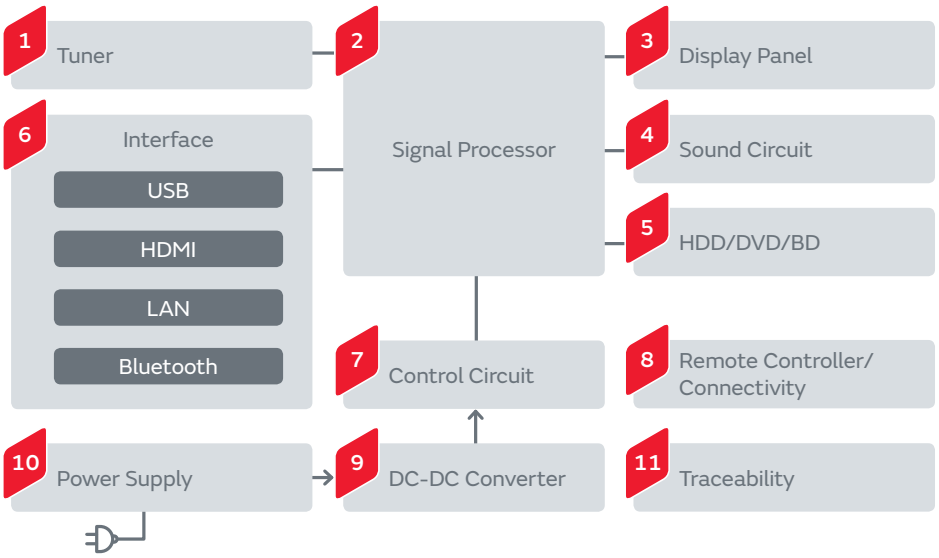
13 Anti-counterfeit

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup	

Televisions



1 Tuner

- Microchip Transformers (Baluns) DXP18B Series
- Crystal Units XRC Series
- Chip Inductors (Chip Coils) LQW Series
- ESD Protection Devices LXES Series

2 Signal Processor

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series
- NFC Antennas FLAN Series
- Thermistors NCP/PRF Series

3 Display Panel

- Non-Isolated DC-DC Converters MYMGK/OKL Series
- Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series
- Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose ZRB Series
- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Chip Common Mode Choke Coils/ Noise Filters DLW/DLP/NFP Series
- Power Inductors LQH Series
- Rotary Position Sensors SV Series
- Thermistors NCP/PRF Series

4 Sound Circuit

- Chip Common Mode Choke Coils DLW/DLP Series

5 HDD/DVD/BD

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Thermistors NCP/PRF Series

6 Interface

Bluetooth Modules

Bluetooth Smart Modules

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils/
Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

7 Control Circuit

Bluetooth Modules

Pyroelectric Infrared Sensors
IRS Series

Ceramic Resonators CERALOCK®
CST Series

8 Remote Controller/Connectivity

Bluetooth Modules

Wi-Fi Modules

Bluetooth Smart Modules

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

ESD Protection Devices
LXES Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG/LQB Series

9 DC-DC Converter

Metal Terminal Type Multilayer Ceramic Capacitors
for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Power Inductors
LQH Series

Thermistors
NCP/PRF Series

10 Power Supply

Chip Multilayer Ceramic
Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin
Molding SMD Type Ceramic
Capacitors for General Purpose
DK1 Series

Safety Standard Certified
Lead Type Disc Ceramic
Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF/PTG Series

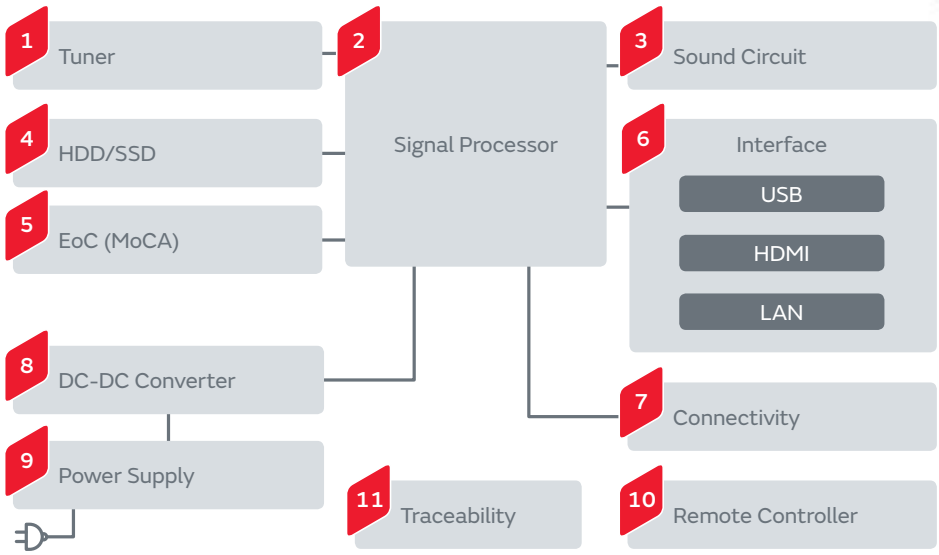
11 Traceability

RFID Tag Device
(MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	

Set-top Box



1 Tuner

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQW Series

ESD Protection Devices
LXES Series

Microchip Transformers (Baluns)
DXP18B Series

2 Signal Processor

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

3 Sound Circuit

Chip Common Mode Choke Coils
DLW/DLP Series

4 HDD/SSD

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Supercapacitors (EDLC)
DMT Series

Thermistors
NCP/PRF Series

5 EoC (MoCA)

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Ceramic Resonators CERALOCK®
CST Series

6 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils/Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

7 Connectivity

Wi-Fi Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

ESD Protection Devices
LXES Series

8 DC-DC Converter

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Power Inductors
LQH/DFE Series

Thermistors
NCP/PRF Series

9 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF/PTG Series

10 Remote Controller

Crystal Units
XRC Series

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

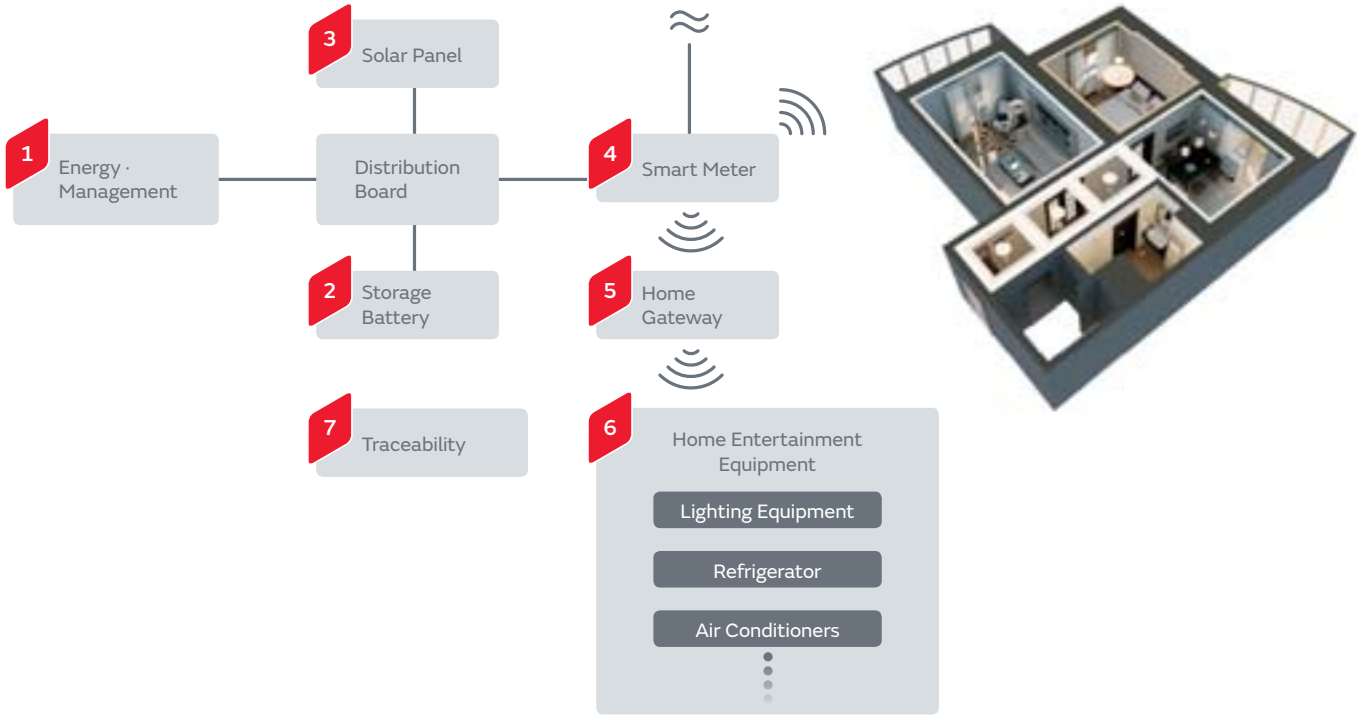
11 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup	

HEMS



1 Energy · Management

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Topics

Introduction of Examples as Energy System
https://www.murata.com/en-global/about/newsroom/news/product/power/2013/0426

2 Storage Battery

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
PRF/PRG/PTG/NCU Series

Small Energy Devices
UMAC/UMAL Series

Energy Storage Module Model
IJ1101M Series

BMU (Battery Management Unit)
IJ8101C Series

BMU-HUB
IJ1101K Series

3 Solar Panel

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Supercapacitors (EDLC)
DMF/DMT Series

4 Smart Meter

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Wi-Fi Modules

Sub-GHz Modules

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Supercapacitors (EDLC)
DMF/DMT Series

Chip Multilayer Ceramic Capacitors for Ethernet LAN and Primary - Secondary Coupling of DC-DC Converters
GR4 Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Crystal Units
XRC Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

Coin Manganese Dioxide Lithium Batteries
Standard Type/Heat-resistant Type

5 Home Gateway

Wi-Fi Modules

Bluetooth Modules

Sub-GHz Modules

6 Home Entertainment Equipment

Bluetooth Modules

Wi-Fi Modules

Sub-GHz Modules

Ultrasonic Sensors
MA Series

Magnetic Sensors (AMR Sensors)
MR Series

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Crystal Units
XRC Series

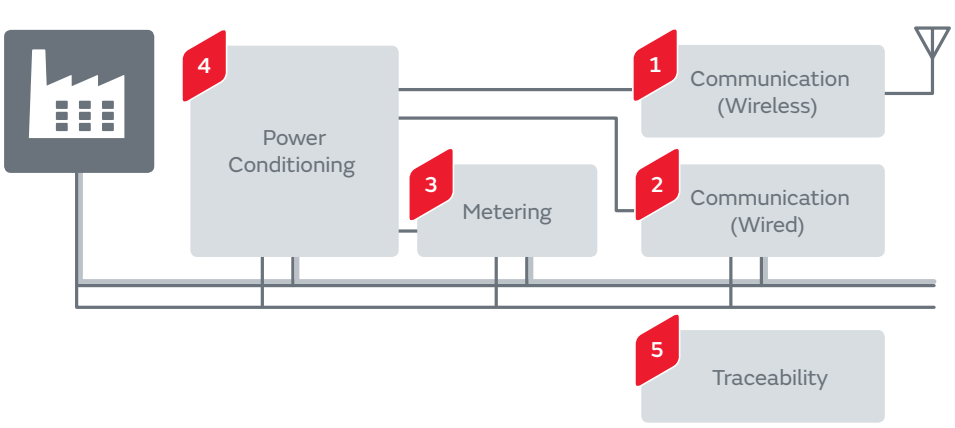
7 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Smartmeter



1 Communication (Wireless)

Wi-Fi Modules

Sub-GHz Modules

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF/PRG/NCU Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

2 Communication (Wired)

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Leaded MLCC for General Purpose
RDE Series

Thermistors
NCP/PRF/PRG/NCU Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

ESD Protection Devices
LXES Series

3 Metering

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP Series

Thermistors
NCP/PRF/PRG/NCU Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

4 Power Conditioning

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Leaded MLCC for General Purpose
RDE Series

Chip Inductors (Chip Coils)
LQH Series

Thermistors
NCP/PRF/PRG/NCU Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Supercapacitors (EDLC)
DMF/DMT Series

Coin Manganese Dioxide Lithium Batteries
Standard Type/Heat-resistant Type

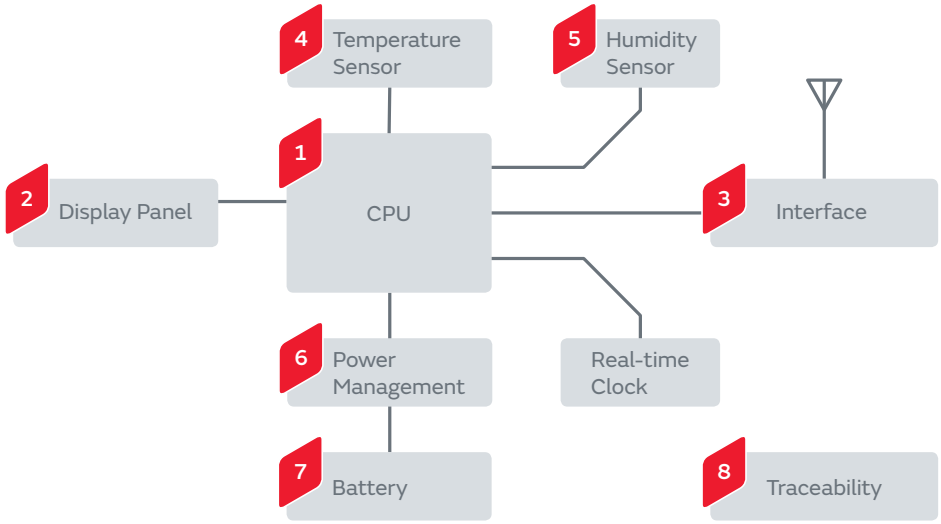
5 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	

Thermostat



1 CPU

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

2 Display Panel

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Thermistors
NCP/PRF Series

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

3 Interface

Bluetooth Modules

Sub-GHz Modules

Wi-Fi Modules

Crystal Units
XRC Series

Ceramic Resonators CERALOCK®
CST Series

Chip Inductors (Chip Coils)
LQM/LQH/LQB Series

ESD Protection Devices
LXES Series

5 Humidity Sensor

Thermistors
NCP/PRF/PRG/PTG Series

Ceramic Resonators CERALOCK®
CST Series

6 Power Management

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

Thermistors
NCP/PRF/PRG Series

4 Temperature Sensor

Thermistors
NCP/PRF/PRG/PTG Series

Ceramic Resonators CERALOCK®
CST Series

7 Battery

Thermistors
NCP/PRF/PRG Series

Supercapacitors (EDLC)
DMF/DMT Series

Small Energy Devices
UMAC/UMAL Series

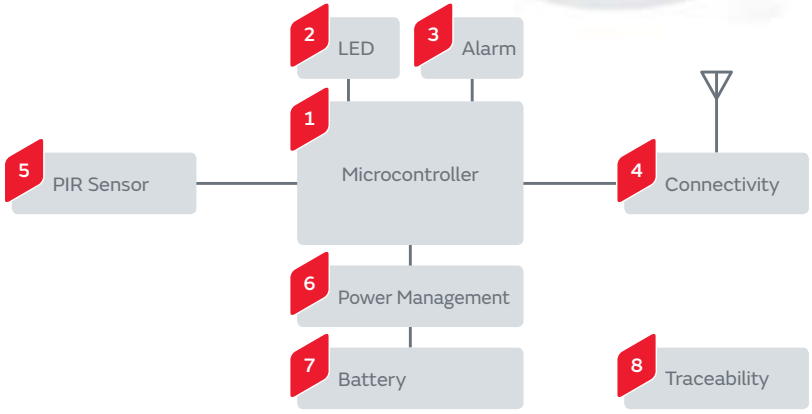
8 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	

Human Detection



1 Microcontroller

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

2 LED

Supercapacitors(EDLC)
DMF/DMT Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF/PRG/PTG Series

3 Alarm

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

5 PIR Sensor

Pyroelectric Infrared Sensors
IRA Series

4 Connectivity

Wi-Fi Modules

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

ESD Protection Devices
LXES Series

6 Power Management

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK®
CST Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP Series

Thermistors
NCP/PRF/PRG Series

7 Battery

Small Energy Devices
UMAC/UMAL Series

Thermistors
NCP/PRF/PRG Series

Coin Manganese Dioxide Lithium Batteries
Standard Type

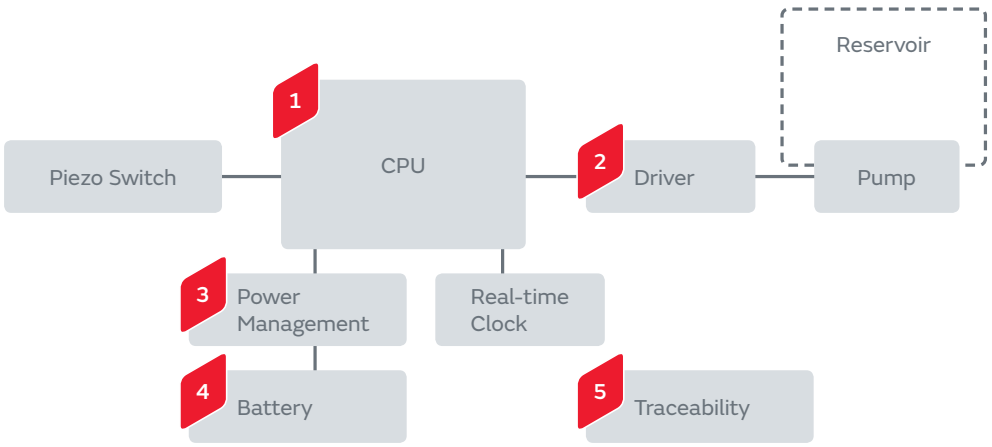
8 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	

Air Dispenser



1 CPU

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

2 Driver

Thermistors
NCP/NXRT/PRF Series

3 Power Management

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK®
CST Series

Thermistors
NCP/PRF Series

4 Battery

Supercapacitors (EDLC)
DMF/DMT Series

Thermistors
NXR/PRF/PRG Series

Small Energy Devices
UMAC/UMAL Series

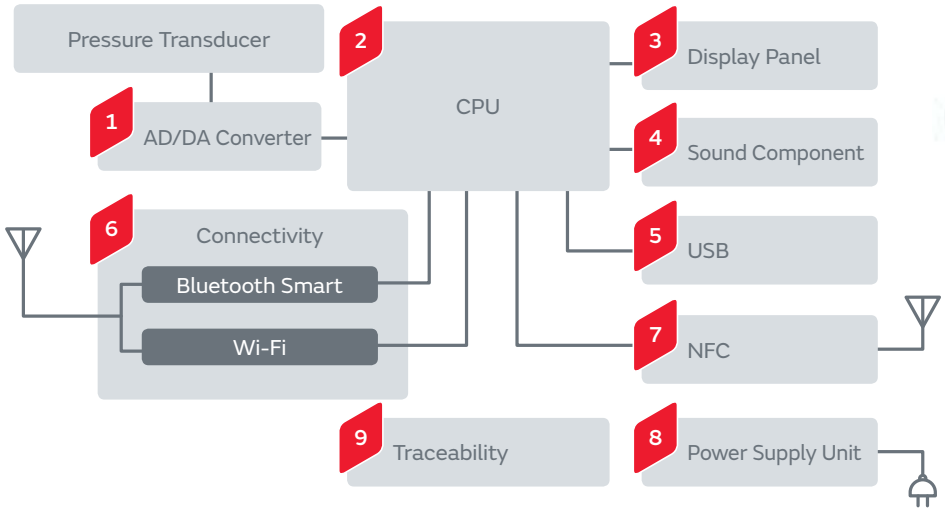
5 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Chip Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	

Blood Pressure Monitor



1 AD/DA Converter

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

2 CPU

Ceramic Resonators
CERALOCK®
CST Series

Thermistors
NCP/NXR Series

4 Sound Component

Piezoelectric Sounders
PKLCS/PKMCS Series

3 Display Panel

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

5 USB

Ceramic Resonators
CERALOCK®
CST Series

Crystal Units
XRC Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

6 Connectivity

ESD Protection Devices
LXES Series

Bluetooth Smart Modules
LBCA/LBMA Series

Wi-Fi Modules

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
PRG Series

7 NFC

NFC Antennas
FLAN Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

ESD Protection Devices
LXES Series

8 Power Supply Unit

Thermistors
NCP Series

Thermistors
PRF/PRG Series

Coin Manganese Dioxide Lithium Batteries
Standard Type

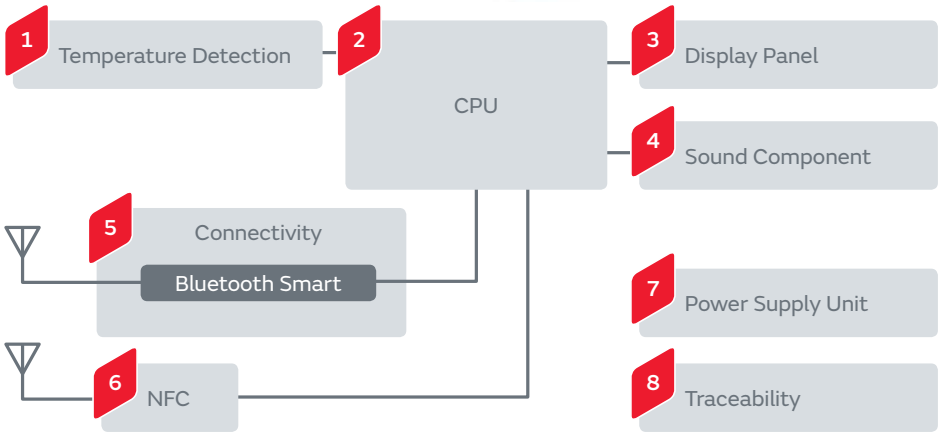
9 Traceability

RFID Tag Device
(MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Supercapacitors (EDLC)	DMF/DMT/DMH Series	Power Line/Battery Peak Assist	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Thermometer



1 Temperature Detection

Thermistors
NXR Series

2 CPU

Ceramic Resonators CERALOCK®
CST Series

3 Display Panel

Thermistors
NCP Series

4 Sound Component

Piezoelectric Sounders
PKLCS/PKMCS Series

5 Connectivity

Bluetooth Modules
LBCA/LBMA Series

Crystal Units
XRC Series

6 NFC

NFC Antennas
FLAN Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

ESD Protection Devices
LXES Series

7 Power Supply Unit

Coin Manganese Dioxide Lithium Batteries
Standard Type

Alkaline Manganese Batteries

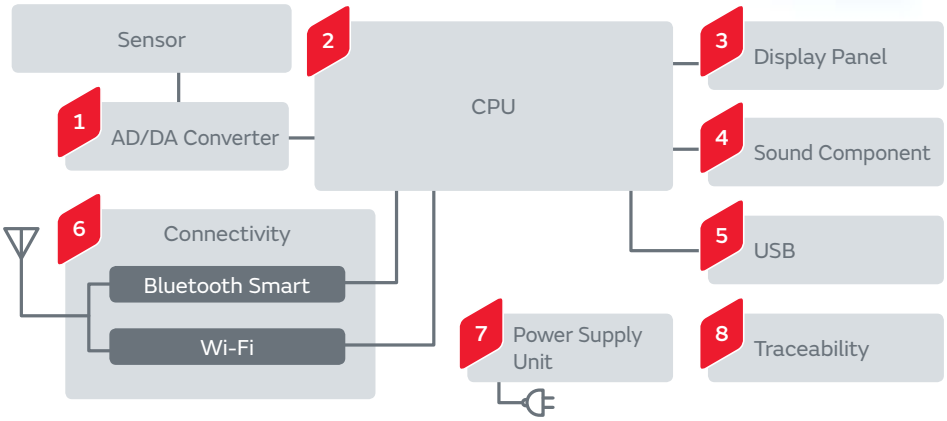
8 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Supercapacitors (EDLC)	DMF/DMT/DMH Series	Power Line/Battery Peak Assist	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Blood Glucose Meter



1 AD/DA Converter

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

2 CPU

Ceramic Resonators CERALOCK®
CST Series

Thermistors
NCP/NXR Series

3 Display Panel

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

4 Sound Component

Piezoelectric Sounders
PKLCS/PKMCS Series

5 USB

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
PRG Series

6 Connectivity

Bluetooth Smart Modules
LBCA/LBMA Series

Wi-Fi Modules

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
PRG Series

7 Power Supply Unit

Thermistors
NCP Series

Thermistors
PRF/PRG Series

Coin Manganese Dioxide Lithium Batteries
Standard Type

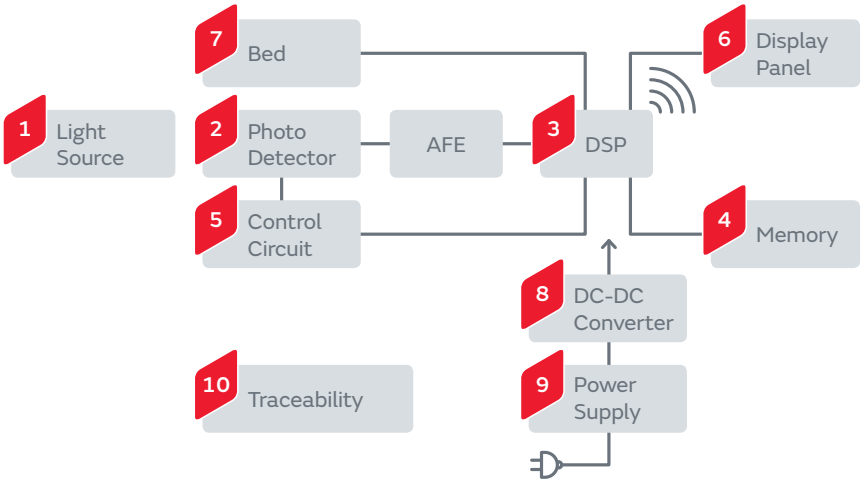
8 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Supercapacitors (EDLC)	DMF/DMT/DMH Series	Power Line/Battery Peak Assist
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Small Energy Devices	UMAC/UMAL Series	Battery Backup

Diagnostic Imaging Apparatus



1 Light Source

Ultra High Voltage Screw Terminal Type Ceramic Capacitors for General Purpose
DHS/DHK Series

2 Photo Detector

Thermistors
NCP/PRF Series

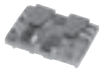
3 DSP

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

4 Memory

Isolated DC-DC Converters
MYB Series



Non-Isolated DC-DC Converters
MYMGK/OKL Series

Supercapacitors (EDLC)
DMF/DMT Series

Small Energy Devices
UMAC/UMAL Series

5 Control Circuit

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Ceramic Resonators CERALOCK®
CST Series

6 Display Panel

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

Thermistors
PRF/PRG Series

7 Bed

Inclinometers
SCA100T/103T Series

8 DC-DC Converter

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Thermistors
NCP/PRF Series

9 Power Supply

Supercapacitors (EDLC)
DMF/DMT Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK®
CST Series

Thermistors
NCP/PRF Series

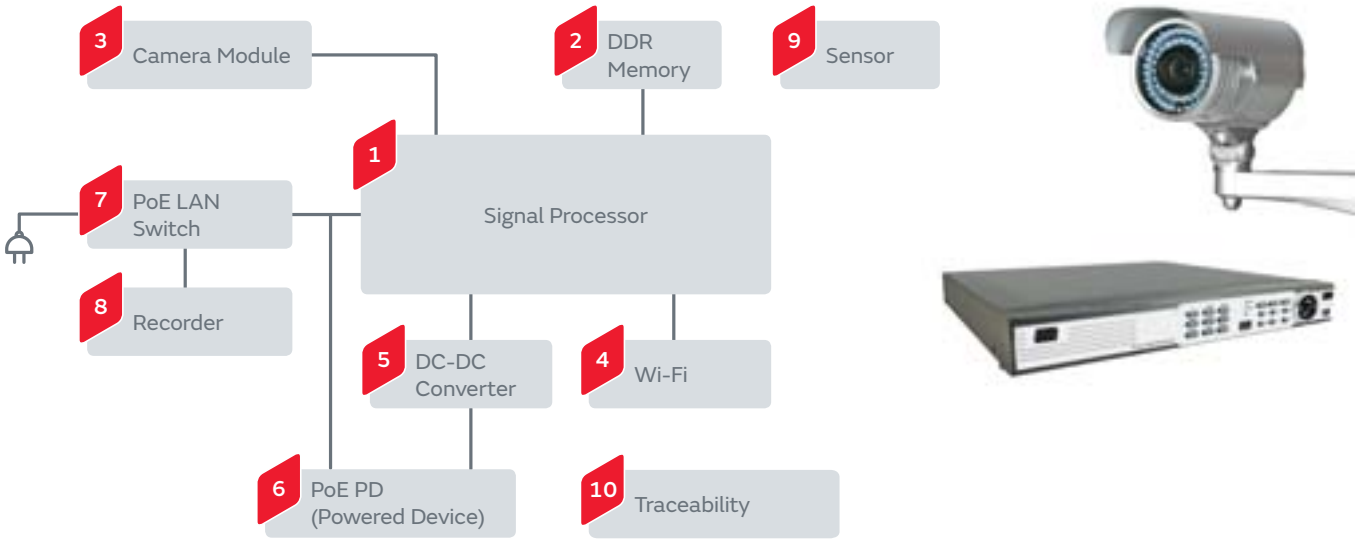
10 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	

Security Camera



1 Signal Processor

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
PRF/NCU Series

2 DDR Memory

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Chip Ferrite Beads
BLM Series

Supercapacitors (EDLC)
DMF/DMT Series

3 Camera Module

Chip Ferrite Beads
BLM Series

4 Wi-Fi

Wi-Fi Modules

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Crystal Units
XRC Series

5 DC-DC Converter

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Power Inductors
LQH/DFE Series

Thermistors
PRF/NCU Series

6 PoE PD (Powered Device)

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Crystal Units
XRC Series

Thermistors
NXRT/PRF/NCU Series

Isolated DC-DC Converters for PoE + PD
MYBSP Series

7 PoE LAN Switch

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Crystal Units
XRC Series

Thermistors
NXRT/PRF/NCU Series

8 Recorder

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Thermistors
PRF/NCU Series

9 Sensor

Pyroelectric Infrared Sensors
IRA Series

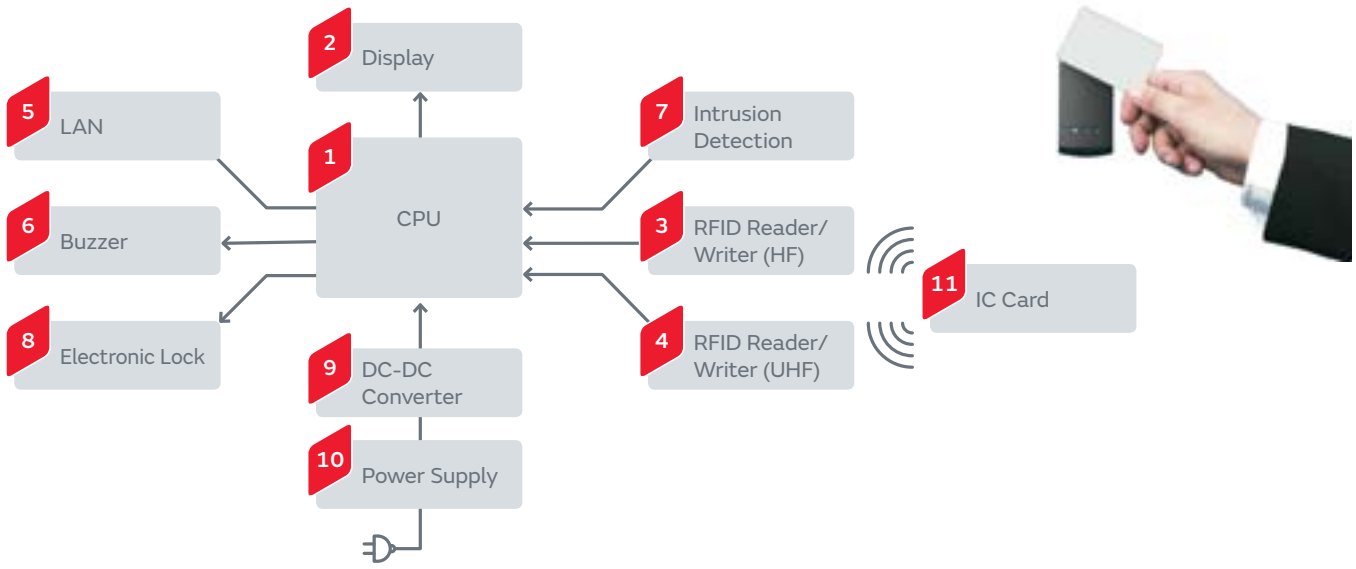
10 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Coin Manganese Dioxide Lithium Batteries	Standard Type/Heat-resistant Type	Battery Backup	

Entrance and Exit Management System



1 CPU

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

2 Display

Ceramic Resonators CERALOCK®
CST Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

3 RFID Reader/Writer (HF)

Crystal Units
XRC Series

RFID Reader/Writer(HF)
LXRF Series

4 RFID Reader/Writer (UHF)

Crystal Units
XRC Series

RFID Reader/Writer(UHF)
LXRF Series

5 LAN

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

6 Buzzer

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

7 Intrusion Detection

Pyroelectric Infrared Sensors
IRA Series

Ultrasonic Sensors
MA Series

Magnetic Sensors (AMR Sensors)
MR Series

8 Electronic Lock

Supercapacitors (EDLC)
DMF/DMT Series

9 DC-DC Converter

Thermistors
NCP/PRF Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

10 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK®
CST Series

Thermistors
NCP/PRFSeries

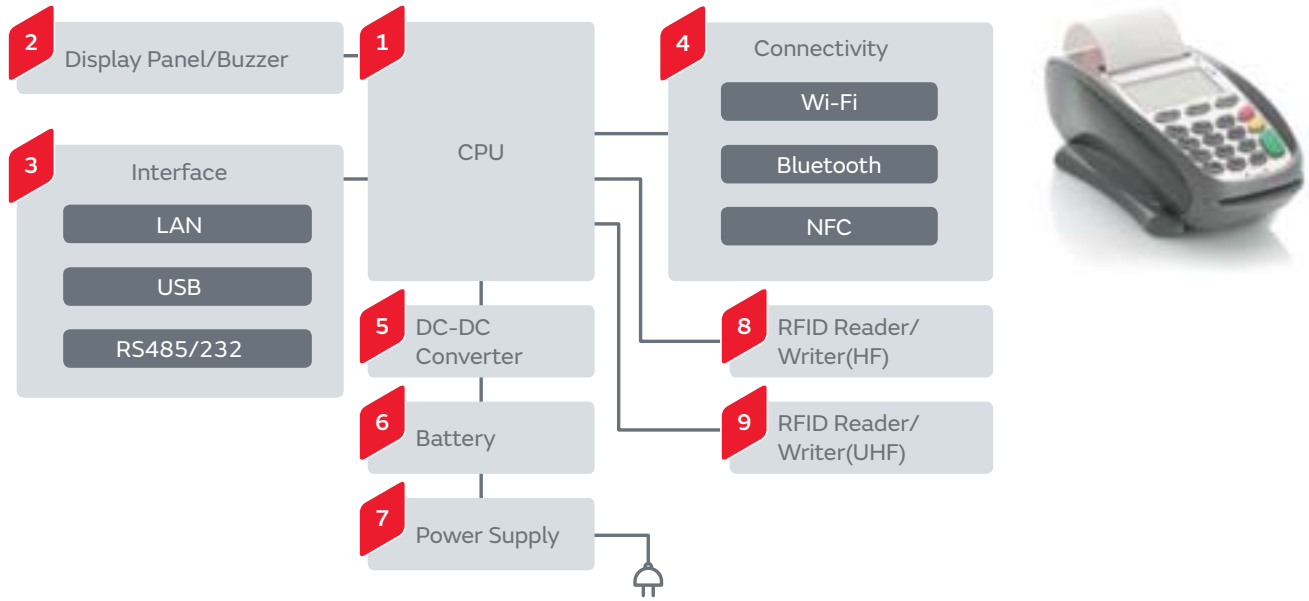
11 IC Card

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	

Electronic POS



1 CPU

Supercapacitors (EDLC)
DMF/DMT Series

ESD Protection Devices
LXES Series

Ceramic Resonators CERALOCK®
CST Series

2 Digital Panel/Buzzer

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Ceramic Resonators CERALOCK®
CST Series

Power Inductors
LQH Series

Thermistors
PRF/PRG Series

Piezoelectric Sounders
PKLCS/PKMCS Series

3 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils/Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

Ceramic Resonators CERALOCK®
CST Series

4 Connectivity

Bluetooth Modules

Bluetooth - Wi-Fi Combo Modules

Bluetooth Smart Modules

Wi-Fi Modules

NFC Antennas
FLAN Series

Crystal Units
XRC Series

5 DC-DC Converter

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Power Inductors
LQH/DEM/DFE Series

Thermistors
NCP/PRF Series

6 Battery

Thermistors
NCP/PRF/PRG Series

7 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF/PRG Series

8 RFID Reader/Writer(HF)

Crystal Units
XRC Series

RFID Reader/Writer(HF)
LXRF Series

9 RFID Reader/Writer(UHF)

Crystal Units
XRC Series

RFID Reader/Writer(UHF)
LXRF Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup	

Heavy Duty Vehicles

Safety
1. ECU
2. TPMS
3. ABS/ESC
4. Headlamp

Comfort/Information
5. Fine Navigation
6. Power Seat/ Power Mirror
7. Cabin Leveling

Operation
8. Motor Grader/Blade Control
9. Forklift/Container Handling

Safety

1 ECU

- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC
- Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
- Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
- AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series
- Leaded MLCC for Automotive RH/RCE Series
- Accelerometers SCA Series
- Gyro Sensors SCC Series
- Thermistors PRF/PTG/NCU Series
- High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

2 TPMS

- Shock Sensors PKGS Series
- Pressure Sensor Elements SCB10H Series
- Thermistors PRF/NCU Series
- Ceramic Filters CERAFIL® SFECF Series
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Coin Manganese Dioxide Lithium Batteries Heat-resistant Type
- High Reliability Chip Inductors LQG15HH Series
- High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

3 ABS/ESC

- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC
- Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
- Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
- AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series
- Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Accelerometers SCA Series
- Gyro Sensors SCC Series
- Thermistors NCG18/NCU Series
- High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

4 Headlamp

- Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
- Ceramic Resonators CERALOCK® CST Series
- Crystal Units XRC Series
- Thermistors NCG18/NCU Series
- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC
- High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

Comfort/Information

5 Fine Navigation

Accelerometers SCA Series

Gyro Sensors SCC Series

MEMS Gyro Sensors SCR Series

High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

6 Power Seat/Power Mirror

Piezoelectric Sounders PKLCS/PKMCS Series

Ceramic Resonators CERALOCK® CST Series

Crystal Units XRC Series

Thermistors PRF/PTG/NCU Series

High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

7 Cabin Leveling

Accelerometers SCA Series

Gyro Sensors SCC Series

Ceramic Resonators CERALOCK® CST Series

Crystal Units XRC Series

High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

Operation

8 Motor Grader/Blade Control

Accelerometers SCA Series

Gyro Sensors SCC Series

MEMS Gyro Sensors SCR Series

Crystal Units XRC Series

Ceramic Resonators CERALOCK® CST Series

High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

9 Forklift/Container Handling

Accelerometers SCA Series

Ceramic Resonators CERALOCK® CST Series

Crystal Units XRC Series

RFID Reader/Writer(UHF) LXRF Series

High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

General Purpose

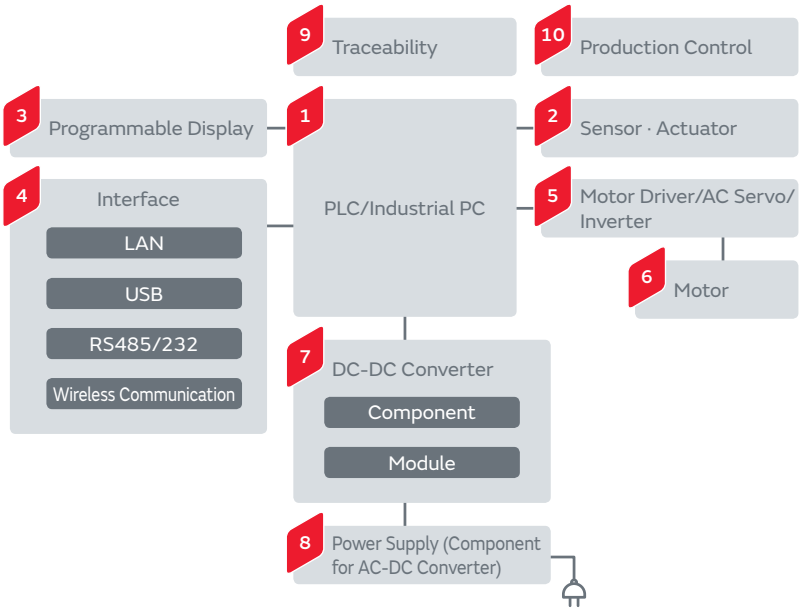
AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infortainment	GRT Series	Coupling/Decoupling	
Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	
Chip Inductors (Chip Coils)	LQW Series	Matching/High Frequency Choke	
Chip Inductors (Chip Coils)	LQM/LQH/DEF Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
EMI Suppression Filters EMIFIL®	NFL/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression	

General Purpose (High Reliability)

Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°c
Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°c
150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°c 175°c 200°c
Chip Inductors (Chip Coils)	LQH32CH/MBH/DFEH Series	Voltage Conversion	85°c 150°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH Series	Common Mode Noise Suppression	125°c

85°c 85°c max. 125°c 125°c max. 150°c 150°c max. 175°c 175°c max. 200°c 200°c max.

Industrial Automation



1 PLC/Industrial PC

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Supercapacitors (EDLC)
DMF/DMT Series

Thermistors
PRF/NCU Series

2 Sensor · Actuator

Magnetic Sensors (AMR Sensors)
MR Series

Shock Sensors
PKGS Series

3 Programmable Display

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Power Inductors
LQH Series

Supercapacitors (EDLC)
DMF/DMT Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP Series

Coin Manganese Dioxide Lithium Batteries
Standard Type/Heat-resistant Type

4 Interface (LAN · USB · RS485/232 · Wireless Communication)

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils/ Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

Wireless Communication Modules Based on the ISA100 Wireless™ Standard
Type 1EU

5 Motor Driver/AC Servo/Inverter

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Large-current Common Mode Choke Coils
PLT10/PLT5B/DLW5A/DLW5B/UCMH Series

Thermistors
PRF/PTG Series

6 Motor

Rotary Sensors

7 DC-DC Converter (Module · Component)

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Power Inductors
LQH Series

Thermistors
PRF/NCU Series

8 Power Supply (Component for AC-DC Converter)

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK®
CST Series

Thermistors
PRF/NCU Series

9 Traceability

Supercapacitors (EDLC)
DMF/DMT/DMH Series

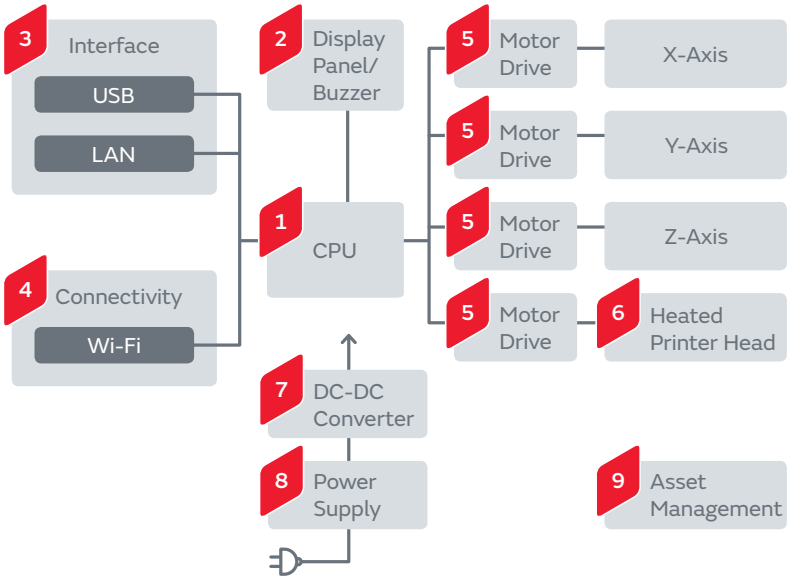
10 Production Control

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

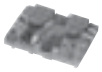
Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound component	

3D Printer



1 CPU

Isolated DC-DC Converters
MYB Series



Non-Isolated DC-DC Converters
MYMGK/OKL Series

Ceramic Resonators CERALOCK®
CST Series

Polymer Aluminum
Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

2 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CST Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

3 Interface

Polymer Aluminum
Electrolytic Capacitors
ECAS/ECNS Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils/
Noise Filters
DLW/DLP/NFP/DLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

4 Connectivity

Wi-Fi Modules

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

ESD Protection Devices
LXES Series

5 Motor Drive

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/OKL Series

Chip Multilayer Ceramic
Capacitors for General Purpose
GR/GA Series

Ceramic Resonators CERALOCK®
CST Series

Crystal Units
XRC Series

Large-current Common Mode Choke Coils
PLT10HH/PLT5BPH/DLW5ATN/UCMH Series

Thermistors
PRF/PTG Series

6 Heated Printer Head

Thermistors
NCP/PRF Series

7 DC-DC Converter

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS/ECNS Series

Thermistors
NCP/PRF Series

8 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF/PRG Series

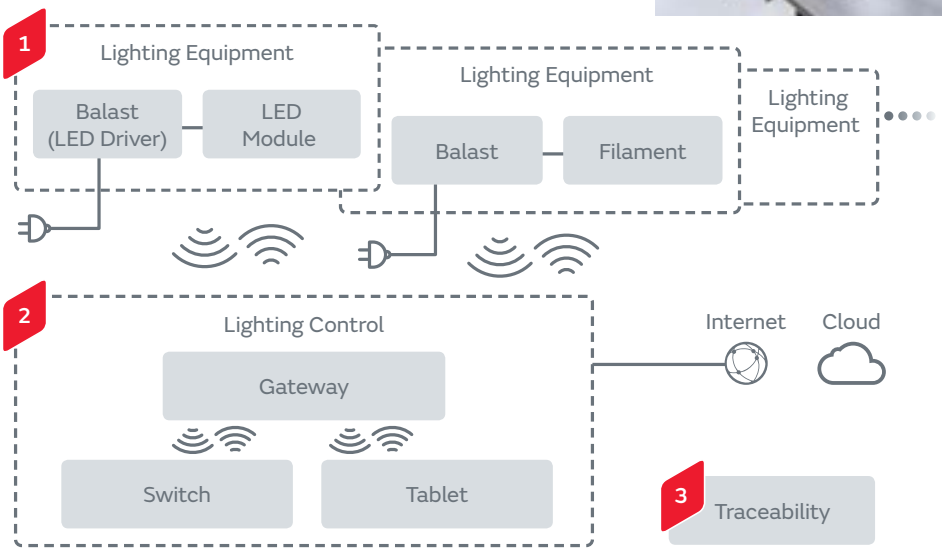
9 Asset Management

RFID Tag Device (MAGICSTRAP®)
LXFL Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Lighting



1 Lighting Equipment

Ballast for LED Lighting

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Wi-Fi Modules

Sub-GHz Modules

Thermistors
NCP/PRF/PRG/PTG Series

Piezoelectric Sounders
PKLCS/PKMCS Series

2 Lighting Control

Wi-Fi Modules

Sub-GHz Modules

Pyroelectric Infrared Sensors
IRA Series

Crystal Units
XRC Series

Ceramic Resonators CERALOCK®
CST Series

3 Traceability

RFID Tag Device (MAGICSTRAP®)
LXMS Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up	
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit	
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	NFE Series	Noise Suppression	
Common Mode Choke Coils/Noise Filters	DLW/DLP/NFP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Small Energy Devices	UMAC/UMAL Series	Battery Backup	

Memo

Design Support Tool "SimSurfing"

https://www.murata.com/simsurfing/

This is the latest tool to see the electrical characteristics of capacitors, inductors, and EMI suppression filters, etc., and to simulate thermistors' behavior!

■Characteristics viewer function

You can easily view electrical characteristic, search part numbers and download the data within Capacitors, Inductors, Ferrite Beads and Common Mode Choke Coils.

■Component performance simulator function

You can search by the simulation on simple circuits for NTC thermistors and PTC thermistors (POSISTOR®) within Thermistors.

■Selection tool function

According to conditions of use, you can select our medium voltage capacitors within Capacitors and power inductors (MPST) within Inductors.

■Search tool function

You can search CERALOCK® and crystal units that are most suitable for your IC and access information about the recommended circuit constant setting within Timing Devices.

■ Usage example of "Mutilayer Ceramic Capacitors" within [Capacitors] category

1 Select the products

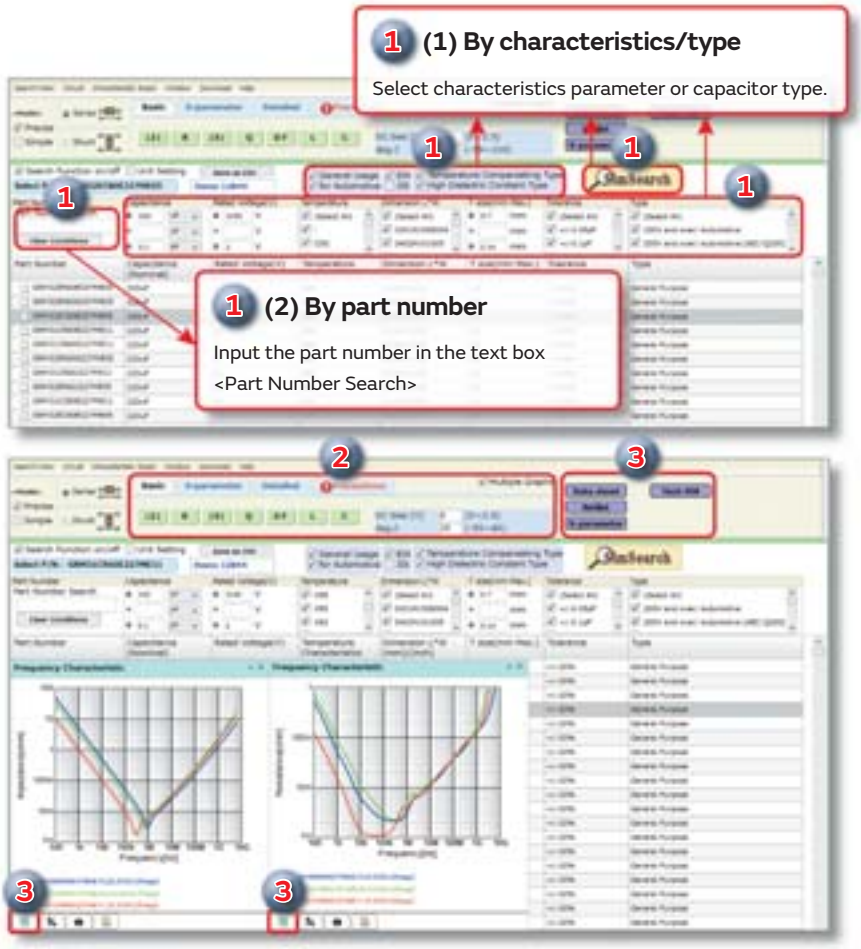
(1) By characteristics/type
(2) By part number

2 Show graph

Click a button on each tab of "Basic," "S-parameter." and "Detailed."

3 Data download

- Click each purple button in this area.
- Click "CSV output" button.



* You can access "SimSurfing" on the two main operating systems as it has been migrated from Flash to HTML except for MPST.
* Images are as of November 2017. Be assured that this software will be updated frequently.

https://www.murata.com/simsurfing/

Index

Global Locations

For details please visit www.murata.com

⚠Note

1 Export Control

For customers outside Japan:

No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

For customers in Japan:

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

2 Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.

1. *Aircraft equipment*
2. *Aerospace equipment*
3. *Undersea equipment*
4. *Power plant equipment*
5. *Medical equipment*
6. *Transportation equipment (vehicles, trains, ships, etc.)*
7. *Traffic signal equipment*
8. *Disaster prevention / crime prevention equipment*
9. *Data-processing equipment*
10. *Application of similar complexity and/or reliability requirements to the applications listed above*

3 Product specifications in this catalog are as of November 2017. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.

4 Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

5 This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

6 Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.

7 No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

Murata Manufacturing Co., Ltd.

www.murata.com

muRata
INNOVATOR IN ELECTRONICS

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Jan.16,2018